# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Programming in C |
| **Course Code** | BCA 103 -[ T] |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 1st | **Semester** | 1st | **Credits** | L | T | P | C |
| | | | | | 0 | 0 | 2 | 2 |
| **Course Type** | Lab only | | | | | | | |
| **Course Category** | Disciplinary Minor | | | | | | | |
| **Pre-Requisite/s** | basic knowledge computer file system. | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** CO1: To understand the fundamentals of Big Data.**(BL1-Remember)**<br>**CO2-** CO2:To understand various C programming Concepts, array and function handling, pointer and structure.**(BL2-Understand)**<br>**CO3-** CO3: To implement Array, structure for data storage, modular programming concepts for solving a big problem into smaller parts.**(BL3-Apply)**<br>**CO4-** CO4: To analyze various decision making and iteration techniques to learn how to improve the performance of the C programs.**(BL4-Analyze)**<br>**CO5-** CO5: To evaluate and compare various data access techniques using pointers.**(BL5-Evaluate)**<br>**CO6-** CO6: To develop solutionsfor realworld problems usingArray,Structure,function and pointers.**(BL6-Create)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG4(Quality education) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit-1 | Fundamentals of C Programming: Overview of C, features of C, IDE of C History of Structure of a C Program; Data types; Datatypes (Examples), C basic Input / Output functions, Constant ,Variable, Identifier, literals, and Keywords, naming variables: Scope and Life of Variables - Local and Global Variable Operators: Arithmetic, Logical, Relational, Conditional and Bitwise and Ternary operators, Precedence and associatively of operators, Types conversion in expression, understanding c program writing its compilation and execution | Lecturing | 6 |
| Unit - 2 | Basic input/output and library functions Single Character Input/Output i.e. getch(),getchar(), getche(), putchar(), Formatted input/output i.e. printf() and scanf(), Library Functions – concepts mathematical and character, functions. Control structures- If Statement, If..... Else Statement, Nesting of If .....Else Statement, Else If Ladder, user of ? : Operator, Switch statement | Lecturing experiments | 6 |
| Unit -3 | Compound Statement and Loop Controls – For, While, Do-While Loops, Break Continue, Exit, Goto Statement, Arrays- Single and Multidimensional and character Arrays, Array Declaration and Initialization, String: Declaration, Initialization, String handling Functions | Lecturing experiments | 6 |
| Unit-4 | Modular Programming: The Need of a Function, User Defined and Library Function, Prototype of a Function, Calling of a function, Function Argument, Passing arguments to function, Return Values, Array as function arguments , Nesting of Function, main() Parameter passing – call by value, call by reference; Recursion, Structure and union: Defining Structure, Structure – basic, membership operator, Declaration Of Structure members and Variable, Accessing Structure Members, Structure Assignment. Defining Union, basics of union,difference between structure and union. | Lecturing experiments | 6 |
| Unit -5 | Pointers: - understanding c pointers, & and * operators, pointer expression, double Pointer, Pointer Arithmetic, Pointer to array, Pointer to Function, pointer as function argument, pointer to structure. Dynamic Memory Allocation in C-Memory management functions in c: malloc(),calloc(),realloc(),free() | Lecturing experiments | 6 |

## List of Experiment

| S.No. | Unit | Experiments | Level Of Difficulty | CO |
|---|---|---|---|---|
| 1. | I | Write a program to print your name , education and address . | **B** | **CO**1 |
| 2. | I | Write a program to declare and initialize variables of different data types, initialize and display values. | **B** | **CO1** |
| 3. | I | Write a program to declare local and global variables and display their values. | **B** | **CO1** |
| 4. | I | Write a Program to perform basic arithmetic operations without user input. | **B** | **CO1** |
| 5. | I | Write a program to check whether a person can vote or not using ternary operator | **M** | **CO1** |
| 6. | I | Write a program to take input from the user of five numbers and calculate sum and average. | **M** | **CO1** |
| 7. | I | Write a program to take input from the user to perform basic arithmetic operations**.** | **M** | **CO1** |
| 8. | I | Write a program to compute area of rectangle sides are entered by the user. | **M** | **CO1** |
| 9. | I | Write a program to calculate square & cube of a number entered by the user | **M** | **CO1** |
| 10. | I | Write Program to calculate simple interest and take input of principle rate and time from the user | **E** | **CO1** |
| 11. | I | Write a program to take input of product_id and calculate cost of product where rate and quantity are supplied by the user . Print the cost of the product along with the product id. | **E** | **CO1** |
| 12. | I | Write a program to calculate area and circumference of circle based on the inputs provided by the user. | **E** | **CO1** |
| 13. | I | Write a program to take input of character using single character functions (getch(), getchar(), getche()) and display using single character output functions (putch() and putchar()) | **B** | **CO1** |
| 14. | II | Write a program to check whether entered number is positive or negative , zero | **B** | **CO1, CO3** |
| 15. | II | Write a program to print ASCII value of character entered by the user. | **B** | **CO1, CO3** |
| 16. | II | Write a program to check whether entered number is even or odd | **B** | **CO1, CO3** |
| 17. | II | Write a program to find out biggest among two or three numbers. | **B** | **CO1, CO3** |
| 18. | II | Write a program to check whether entered year is leap year or not? | **B** | **CO1, CO3** |
| 19. | II | Write a program to print result of students as I II III divisions and fail based on the marks entered by the | **E** | **CO1, CO3** |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | E.Balagurusamy Programming using ANSIC TataMcGraw-HillPublishing |
| **Articles** | |
| **References Books** | |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | - | - | - | 2 | - | - | - | - | - | - | - | 2 | 3 | 1 |
| CO2 | 1 | 2 | 1 | 2 | 2 | 1 | - | - | - | - | - | - | 1 | - | - |
| CO3 | 2 | - | 1 | - | - | 2 | - | - | - | - | - | - | 3 | 2 | 2 |
| CO4 | 2 | 1 | - | 2 | - | - | - | - | - | - | - | - | 3 | 2 | 2 |
| CO5 | 2 | 1 | - | 2 | 1 | - | - | - | - | - | - | - | 3 | 3 | 2 |
| CO6 | 2 | 2 | - | 2 | 1 | - | - | - | - | - | - | - | 2 | 2 | 3 |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Programming in C |
| **Course Code** | BCA-103[P] |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 1st | **Semester** | 1st | **Credits** | L | T | P | C |
| | | | | | 0 | 0 | 2 | 2 |
| **Course Type** | Lab only | | | | | | | |
| **Course Category** | Disciplinary Minor | | | | | | | |
| **Pre-Requisite/s** | basic knowledge computer file system. | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** CO1: To understand the fundamentals of Big Data.**(BL1-Remember)**<br>**CO2-** CO2:To understand various C programming Concepts, array and function handling, pointer and structure.**(BL2-Understand)**<br>**CO3-** CO3: To implement Array, structure for data storage, modular programming concepts for solving a big problem into smaller parts.**(BL3-Apply)**<br>**CO4-** CO4: To analyze various decision making and iteration techniques to learn how to improve the performance of the C programs.**(BL4-Analyze)**<br>**CO5-** CO5: To evaluate and compare various data access techniques using pointers.**(BL5-Evaluate)**<br>**CO6-** CO6: To develop solutionsfor realworld problems usingArray,Structure,function and pointers.**(BL6-Create)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG4(Quality education) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit-1 | Fundamentals of C Programming: Overview of C, features of C, IDE of C History of Structure of a C Program; Data types; Datatypes (Examples), C basic Input / Output functions, Constant ,Variable, Identifier, literals, and Keywords, naming variables: Scope and Life of Variables - Local and Global Variable Operators: Arithmetic, Logical, Relational, Conditional and Bitwise and Ternary operators, Precedence and associatively of operators, Types conversion in expression, understanding c program writing its compilation and execution | Lecturing | 6 |
| Unit - 2 | Basic input/output and library functions Single Character Input/Output i.e. getch(),getchar(), getche(), putchar(), Formatted input/output i.e. printf() and scanf(), Library Functions – concepts mathematical and character, functions. Control structures- If Statement, If..... Else Statement, Nesting of If .....Else Statement, Else If Ladder, user of ? : Operator, Switch statement | Lecturing experiments | 6 |
| Unit -3 | Compound Statement and Loop Controls – For, While, Do-While Loops, Break Continue, Exit, Goto Statement, Arrays- Single and Multidimensional and character Arrays, Array Declaration and Initialization, String: Declaration, Initialization, String handling Functions | Lecturing experiments | 6 |
| Unit-4 | Modular Programming: The Need of a Function, User Defined and Library Function, Prototype of a Function, Calling of a function, Function Argument, Passing arguments to function, Return Values, Array as function arguments , Nesting of Function, main() Parameter passing – call by value, call by reference; Recursion, Structure and union: Defining Structure, Structure – basic, membership operator, Declaration Of Structure members and Variable, Accessing Structure Members, Structure Assignment. Defining Union, basics of union,difference between structure and union. | Lecturing experiments | 6 |
| Unit -5 | Pointers: - understanding c pointers, & and * operators, pointer expression, double Pointer, Pointer Arithmetic, Pointer to array, Pointer to Function, pointer as function argument, pointer to structure. Dynamic Memory Allocation in C-Memory management functions in c: malloc(),calloc(),realloc(),free() | Lecturing experiments | 6 |

## List of Experiment

| S.No. | Unit | Experiments | Level Of Difficulty | CO |
|---|---|---|---|---|
| 1. | I | Write a program to print your name , education and address . | **B** | **CO**1 |
| 2. | I | Write a program to declare and initialize variables of different data types, initialize and display values. | **B** | **CO1** |
| 3. | I | Write a program to declare local and global variables and display their values. | **B** | **CO1** |
| 4. | I | Write a Program to perform basic arithmetic operations without user input. | **B** | **CO1** |
| 5. | I | Write a program to check whether a person can vote or not using ternary operator | **M** | **CO1** |
| 6. | I | Write a program to take input from the user of five numbers and calculate sum and average. | **M** | **CO1** |
| 7. | I | Write a program to take input from the user to perform basic arithmetic operations**.** | **M** | **CO1** |
| 8. | I | Write a program to compute area of rectangle sides are entered by the user. | **M** | **CO1** |
| 9. | I | Write a program to calculate square & cube of a number entered by the user | **M** | **CO1** |
| 10. | I | Write Program to calculate simple interest and take input of principle rate and time from the user | **E** | **CO1** |
| 11. | I | Write a program to take input of product_id and calculate cost of product where rate and quantity are supplied by the user . Print the cost of the product along with the product id. | **E** | **CO1** |
| 12. | I | Write a program to calculate area and circumference of circle based on the inputs provided by the user. | **E** | **CO1** |
| 13. | I | Write a program to take input of character using single character functions (getch(), getchar(), getche()) and display using single character output functions (putch() and putchar()) | **B** | **CO1** |
| 14. | II | Write a program to check whether entered number is positive or negative , zero | **B** | **CO1, CO3** |
| 15. | II | Write a program to print ASCII value of character entered by the user. | **B** | **CO1, CO3** |
| 16. | II | Write a program to check whether entered number is even or odd | **B** | **CO1, CO3** |
| 17. | II | Write a program to find out biggest among two or three numbers. | **B** | **CO1, CO3** |
| 18. | II | Write a program to check whether entered year is leap year or not? | **B** | **CO1, CO3** |
| 19. | II | Write a program to print result of students as I II III divisions and fail based on the marks entered by the | **E** | **CO1, CO3** |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | E.Balagurusamy Programming using ANSIC TataMcGraw-HillPublishing |
| **Articles** | |
| **References Books** | |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | - | - | - | 2 | - | - | - | - | - | - | - | 2 | 3 | 1 |
| CO2 | 1 | 2 | 1 | 2 | 2 | 1 | - | - | - | - | - | - | 1 | - | - |
| CO3 | 2 | - | 1 | - | - | 2 | - | - | - | - | - | - | 3 | 2 | 2 |
| CO4 | 2 | 1 | - | 2 | - | - | - | - | - | - | - | - | 3 | 2 | 2 |
| CO5 | 2 | 1 | - | 2 | 1 | - | - | - | - | - | - | - | 3 | 3 | 2 |
| CO6 | 2 | 2 | - | 2 | 1 | - | - | - | - | - | - | - | 2 | 2 | 3 |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Environmental Science |
| **Course Code** | BCA-104[T] |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 1st | **Semester** | 1st | **Credits** | L | T | P | C |
| | | | | | 2 | 0 | 2 | 4 |
| **Course Type** | Embedded theory and lab | | | | | | | |
| **Course Category** | Discipline Core | | | | | | | |
| **Pre-Requisite/s** | Student must have knowledge about Language proficiency. | | | **Co-Requisite/s** | Knowledge of English language | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** To remember various concept of environmental education and ecosystem and also about its functions and knowledge about the conservation of biodiversity and its importance. **(BL1-Remember)**<br>**CO2-** To understand about natural resource, its importance and environmental impacts of human activities on natural resource.**(BL2-Understand)**<br>**CO3-** To implement various concepts and methods from ecological and physical sciences and their application in environmental problem solving.**(BL3-Apply)**<br>**CO4-** To gain the knowledge about the different types of pollutions and their control technologies.**(BL4-Analyze)**<br>**CO5-** To Acquire values and attitudes towards understanding complex environmental-economic social challenges, and participating actively in solving current environmental problems and preventing the future ones.**(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✓<br>Environment ✓ | | **SDG (Goals)** | SDG4(Quality education)<br>SDG6(Clean water and sanitation)<br>SDG7(Affordable and clean energy)<br>SDG10(Reduced inequalities)<br>SDG12(Responsible consuption and production)<br>SDG13(Climate action)<br>SDG14(Life below water)<br>SDG15(Life on land) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Module 1 | Environmental Education, Ecosystem & Ecology Environmental Education- Definition, scope, importance, Need for Public Awareness, Multidisciplinary nature of Environmental Science, Environment – Definition and its segments, (Lithosphere, Hydrosphere, Atmosphere and Biosphere) Ecology and Ecosystem: Basic concepts, Type & Components, Energy Flow, Food chain, food web, Ecological Pyramids & Biodiversity (importance, threats & conservation). | Classroom Lecture, PPts, Videoes | 7 |
| Module 2 | Natural Resources Management & Energy Resources Natural Resources – Classification, Water Resources (availability, quality, water budget), Mineral Resources (distribution, availability and future perspectives), and Forest Resources and its management. Energy Resources- Classification, - Conventional (Mineral Oil, Coal and Gas), Non-Conventional (Solar, Geothermal, Wind, Nuclear, Hydrogen, Biomass Energy. | Classroom Lecture, PPts, | 8 |
| Module 3 | Environmental Pollution and Control Air pollution - Causes, Effects & Control methodologies. Water pollution – sources & effects, characteristics and treatment of waste water, Soil - Formation of soil, elementary and mineral composition, effects and abatements. Noise Pollution and Hazards | Classroom Lecture, PPts, Videoes | 6 |
| Module 4 | Environmental Issues and Legislations Population Growth & Explosion, Global warming, Acid Rain, Ozone Layer depletion, Photochemical smog. Environmental legislations in India – Air Act, Water Act, Environment Protection Act & Wild life Act. | Classroom Lecture, PPts, Videos | 7 |
| Module 5 | Ethics, Solid waste Management & EIA Ethics (types & theories) and moral values, NGOs and their role in environmental preservations, Effectiveness of various religions in environmental conservation Solid waste - impacts on Society & management strategies. Environmental Impact Assessment – Methods & Process in India | Classroom Lecture, PPts, Videos | 6 |

## Part C

| Modules | Title | Indicative-ABCA/PBL/ Experiments/Field work/ Internships | Bloom's Level | Hours |
|---|---|---|---|---|
| 1 | To measure the intensity of Light at different locations in the ITM University campus by using Light Meter. | Experiments | BL4-Analyze | 4 |
| 2 | To measure the intensity of Noise at different places in the ITM University campus by using Sound Meter. | Experiments | BL4-Analyze | 4 |
| 3 | To analyze the grassland ecosystem and calculate the Important Value Index (IVI) by quadrate method. | Field work | BL2-Understand | 4 |
| 4 | To determine the TDS and Conductivity of the given water samples. | Experiments | BL4-Analyze | 4 |
| 5 | To determine the pH of given water and soil samples. | Experiments | BL4-Analyze | 4 |
| 6 | To determine the turbidity of given water samples. | Experiments | BL4-Analyze | 4 |
| 7 | To determine the strength of calcium ion in the given water sample | Experiments | BL4-Analyze | 4 |
| 8 | To find out the amount of Dissolved Oxygen (DO) in the given sample of water. | Experiments | BL4-Analyze | 4 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | Chauhan, B. S. (2008b). Environmental Studies. Firewall Media.<br>Cunningham, W., & Cunningham, M. (2014). Ebook: Environmental Science: A Global Concern. McGraw Hill. |
| **Articles** | |
| **References Books** | Peavy, H. S., Rowe, D. R., & Tchobanoglous, G. (1985b). Environmental Engineering. McGraw-Hill Publishing Company.<br>Masters, G. M., & Ela, W. (2008). Introduction to Environmental Engineering and Science. Pearson. |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | - | - | - | 2 | 2 | - | - | - | 2 | - | - | 1 | - | 1 |
| CO2 | 2 | 2 | 1 | 2 | 2 | 2 | - | - | - | 2 | - | - | 1 | - | 3 |
| CO3 | 2 | 1 | 1 | - | 1 | - | - | - | - | 2 | - | - | 3 | 2 | 3 |
| CO4 | 3 | 2 | - | 2 | 1 | - | - | - | - | 2 | - | - | 2 | 3 | 3 |
| CO5 | 3 | 2 | - | 2 | 1 | - | - | - | - | 2 | - | - | 2 | 2 | 3 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | General English |
| **Course Code** | BCA-105[T] |

Part A

| Year | 1st | Semester | 1st | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2 | 0 | 2 | 4 |
| **Course Type** | Embedded theory and lab | | | | | | | |
| **Course Category** | Discipline Core | | | | | | | |
| **Pre-Requisite/s** | Language Proficiency ,reading and writing skills | | | **Co-Requisite/s** | Basic Computer Skills: In today's digital age, many general English courses require basic computer skills, such as word processing, internet research, and email communication. Access to Learning Resources: Some courses may require access to specific learning resources, such as textbooks, online platforms, or library materials. Participation in Language Labs or Workshops: Certain English courses may have corequisites that involve attending language labs, conversation practice sessions, or writing workshops to supplement classroom learning. Language Proficiency Test Scores: While not always a strict corequisite, some institutions may recommend or require students to have achieved certain scores on English language proficiency tests (e.g., TOEFL, IELTS) to ensure they can keep up with the course material. Commitment to Attendance and Participation: Many English courses emphasize active participation in class discussions, group activities, and presentations. Therefore, a corequisite may involve a commitment to regular attendance and engagement in course activities. Prerequisite English Courses: While not strictly corequisites, some courses may recommend or require completion of prerequisite English courses to ensure students have a foundational understanding before progressing to more advanced material. Language Learning Strategies or Study Skills Workshops: Corequisites may include workshops or modules focused on language learning strategies, study skills, or time management techniques to help students succeed in their English studies. Language Exchange or Immersion Programs: In some cases, institutions may encourage or require participation in language exchange programs or immersion experiences to complement classroom learning and enhance language proficiency. | | | |

| | | | |
|---|---|---|---|
| **Course Outcomes & Bloom's Level** | **CO1-** Comprehend and summarize characteristics & various structural principles prerequisite to Technical Communication**(BL1-Remember)**<br>**CO2-** Classify and formulate the elementary intricacies of Scientific and Technical Writing using applicative grammar construct.**(BL2-Understand)**<br>**CO3-** Create cohesive technical paragraphs & text.**(BL3-Apply)**<br>**CO4-** Paraphrase text(s) and use appropriate referencing styles.**(BL4-Analyze)** | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | **SDG (Goals)** | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| 1 | Introduction to Communication Definition, Process, Principles and Types Forms & Grapevine Barriers & Noise | Whiteboard, PPT | 12 |
| 2 | Language Know-how Common Errors Learning through examples Functional Grammar & Contemporary usage | Whiteboard, Quiz, English Lab | 12 |
| 3 | Paragraph Development Techniques Principles & Methods Instruments for Cohesive Writing Creating Mind Maps/Infographic | Whiteboard, Assignments, English Language Labs | 12 |
| 4 | Writing skills Introduction to writing skills. Tone, Orientation, Attitude, Formal vs Informal, general writing, technical writing Letter/ Application/e-mail, Format, and content Indianisms in Email Writing  Writing for the Web: Do's & Don'ts of Email Writing,  Netiquette | Whiteboard, Assignments, English Language Labs | 14 |

Part C

| Modules | Title | Indicative-ABCA/PBL/ Experiments/Field work/ Internships | Bloom's Level | Hours |
|---|---|---|---|---|
| lab | group discussion ,role play, jam, e-mail writing | PBL | BL6-Create | 2 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | Prasad, V., “Advanced Communication Skills”, Atma Ram Publications, New Delhi.  Madhukar, R., K, “Business Communication”, Vikas Publishing House Pvt. Ltd.  Cloud Computing-2014 written by authors of Indian English  Lesikar, (2009), Business Communication: Making Connections in a Digital World, McGraw Hill Education. |
| **Articles** | |
| **References Books** | McGraw, S. J., (2008) Basic Managerial Skills for Al, 8th edition, Prentice H a l of India.  Wren & Martin, (2008), English Grammar and Composition, Sultan Chand &Sons  Pal Rajendra, Korlaha, Hi, J, S., “Essentials of Business Communication”, Sultan Chand & Sons  Rutherford, Andrea, J., “Basic Communication Skills for Technology”, Pearson Education Asia |
| **MOOC Courses** | |
| **Videos** | https://www.youtube.com/watch?v=QGHBq5OEsBM |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | - | - | - | - | - | - | - | - | - | - | 3 | - | - |
| CO2 | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | 3 | - |
| CO3 | 3 | 2 | - | - | - | - | - | - | - | - | - | - | 3 | - | - |
| CO4 | 3 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Discrete Mathematics |
| **Course Code** | BCA-106[T] |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 1st | **Semester** | 1st | **Credits** | L | T | P | C |
| | | | | | 3 | 1 | 0 | 4 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Discipline Core | | | | | | | |
| **Pre-Requisite/s** | | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Understand Boolean algebra define on the sets and its application.**(BL1-Remember)**<br>**CO2-** To learn the Switching theory.**(BL2-Understand)**<br>**CO3-** Understand the basic ideas knowledge of determinant.**(BL3-Apply)**<br>**CO4-** Understand the basic ideas knowledge of matrix.**(BL3-Apply)**<br>**CO5-** To learn the application part of matrix**(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit – 1(Boolean algebra:) | Definition and properties of Boolean algebra, a brief introduction to the application of Boolean algebra to switching theory, conversion of complicated switching circuits to simple one. | Whiteboard, PPT, Video Case Study, Project Based Activity, Application Based Activity | 8 |
| Unit – 2 (Boolean function) | Definition and Types of Boolean Functions, Disjunctive and Conjunctive normal forms, Logic Gates. | Whiteboard, PPT, Video Case Study, Project Based Activity, Application Based Activity | 8 |
| Unit – 3 (Determinant) | Definition, Minors, Cofactors, and Properties of Determinants. Cramer Rule for solving simultaneous Linear equations. | Whiteboard, PPT, Video Case Study, Project Based Activity, Application Based Activity | 8 |
| Unit –4 (Matrices) | Definition, Types of Matrices, Addition, Subtraction, Scalar Multiplication and Multiplication of Matrices, Ad joint, Inverse, Rank and Normal Form. | Whiteboard, PPT, Video Case Study, Project Based Activity, Application Based Activity | 8 |
| Unit – 5 | Solutions of Simultaneous Linear equations, Cayley Hamilton Theorem, Eigen value and Eigen vector. A case study of Anupam Mishra (Ponds are still relevant, Saaf Maathe Ka Samaj, Rajasthan Ki Rajat Bunden & Paryavaran Ke Path). Solid waste: Generation and waste characterization. Impact on society & management strategies. Swachha Bharat Abhiyan | Whiteboard, PPT, Video Case Study, Project Based Activity, Application Based Activity | 8 |

Part D(Marks Distribution)

| **Theory** | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | Liu, C. L. (2000b). Elements Of Discrete Mathematics 2/E.<br>Lipschutz, S., & Lipson, M. (2006c). Discrete Mathematics. |
| **Articles** | |
| **References Books** | Tremblay, J. P., & Manohar, R. (1975c). Discrete Mathematical Structures with Applications to Computer Science.McGraw-Hill Companies<br>K. H. (2018c). Discrete Mathematics and Its Applications. |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | 2 | 1 | - | - | - | - | - | - | - | 3 | - | 1 | 2 | 1 |
| CO2 | 1 | 2 | 1 | - | - | - | - | - | - | - | - | - | 1 | 2 | 3 |
| CO3 | 1 | 2 | 1 | - | - | - | - | - | - | - | 3 | - | 1 | 3 | 3 |
| CO4 | 1 | 2 | 1 | - | - | - | - | - | - | - | 3 | - | 1 | 2 | 3 |
| CO5 | 1 | 2 | 1 | - | - | - | - | - | - | - | 3 | - | 1 | 3 | 3 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Office Management Tools |
| **Course Code** | BCA-107[P] |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 1st | **Semester** | 1st | **Credits** | L | T | P | C |
| | | | | | 0 | 0 | 2 | 2 |
| **Course Type** | Lab only | | | | | | | |
| **Course Category** | Disciplinary Minor | | | | | | | |
| **Pre-Requisite/s** | | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** To remember various concept of Information Technology, Computer System, various peripherals, I/o devices, and storage devices.**(BL1-Remember)**<br>**CO2-** To Understand the Basic concept of operating system, working of MS PowerPoint software and working of MS PowerPoint software .**(BL2-Understand)**<br>**CO3-** To Apply concept to identify type of software, Create formula using MS Excel Tool . **(BL3-Apply)**<br>**CO4-** To Analyze Various softwares , Analyze the data by using statistical functions using MS- Excel tool and with absolute and relative cell references using MS-Excel tool**(BL4-Analyze)**<br>**CO5-** To evaluate and summarize the performance of various operating system, graphs and tables created in Microsoft Excel , equations and sample calculations .**(BL5-Evaluate)**<br>**CO6-** To Create various documents newsletters, brochures, making document using photographs, charts, presentation, documents, drawings and other graphic images.**(BL6-Create)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1 | Basic Skills In and out view of different components of computer (Hardware), booting the machine, GUI of desktop, input and output interfacing. | Lecturing | 9 |
| Unit 2 | Microsoft Word Introduction Word - Uses of Word Processor – Working with Word - Explore the use of graphics and different fonts, understand and to make use of basic features of documents, Advanced Word Processing - Managing Document Changes - Advanced Editing and Formatting - Protecting and Sharing Documents - Customizing Documents - Using Macros, Quick parts, and Content Links - Using Fields, Forms and Indexes. | Lecturing | 8 |
| Unit 3 | Excel [Spreadsheets] Introduction Spreadsheets - Uses of Spreadsheets - Anatomy of a Spreadsheet - Creating a Spreadsheet - Formatting a Spreadsheet- Explore the tools available in spreadsheets, including formulas and calculations, Inserting and working on Graphs, Using office backstage - Using basic formulas - Using functions -Formatting cells and Ranges - Formatting worksheets - Managing worksheets - Working with data and Macros - Using advanced formulas - Securing and sharing workbooks - Creating charts - Adding pictures and shapes to a worksheet. | Lecturing,Experiment | 9 |
| Unit 4 | Power Point Presentation Introduction Power point presentation (PPT) – Uses of PPT - Creating and Formatting a Presentation - Slide Show Mode, Speaker Notes, and Outline Mode - Drawing Diagrams - Tables and Charts, review each slide template - Duplicate, move and import slides - Insert pictures and video clips - manage add-ins and security options - Create handouts - Create and apply master slides - Manage proofing options - manage language options - Use “Presenter Tools”- Connect to the projection system. | Lecturing,Experiment | 9 |
| Unit 5 | Use of Excel for Statistical Analysis Data Classification and Presentation - Cumulative Frequency Distribution - Bivariate Frequency Distributions - Tabulation of Data - Graphical Representation - Other Forms of Representation Measures of Location and Dispersion - The Arithmetic Mean – The Median – The Mode – Geometric and Harmonic Mean – Other methods of Location: Quartiles, Deciles and Percentiles – Measures of Variations or Dispersion – The Variance and Standard Deviation. Correlation - Scatter diagram – correlation coefficient Overview of Microsoft Access | Lecturing,Experiment | 10 |

| | | | |
|---|---|---|---|
| | Databases – Design and Create Tables to Store Data – Simplify Data Entry with Forms - Obtain Valuable Information Using Queries - Create Professional Quality Output with Reports – Design and Implement Powerful Relational Databases - Build User Friendly Database Systems. | | |

## Part C

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | Alexander, M., & Kusleika, R. (2015b). Access 2016 Bible. John Wiley & Sons.<br>Berk, K. N. (2006b). Data Analysis with Microsoft Excel. |
| **Articles** | |
| **References Books** | |
| **MOOC Courses** | |
| **Videos** | |

Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 1 | - | - | - | - | - | - | - | - | - | 1 | 2 | 1 | 1 |
| CO2 | 2 | 3 | - | - | 2 | - | - | - | - | 1 | - | 1 | - | 2 | 1 |
| CO3 | 2 | 2 | 3 | 1 | 3 | - | - | - | - | - | 1 | 2 | 2 | - | 3 |
| CO4 | 2 | 3 | 2 | 3 | 3 | - | - | - | - | 2 | - | 2 | - | 1 | 2 |
| CO5 | 2 | 3 | 2 | 3 | 3 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 2 |
| CO6 | 2 | 2 | 3 | 2 | 3 | - | - | - | - | 3 | 2 | 3 | 3 | - | 1 |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Computer Fundamentals and Applications |
| **Course Code** | BCA101[T] |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 1st | **Semester** | 1st | **Credits** | L | T | P | C |
| | | | | | 3 | 0 | 0 | 3 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Disciplinary Minor | | | | | | | |
| **Pre-Requisite/s** | NIL | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** To remember various concept of Information Technology, Computer System, various peripherals, I/o devices, and storage devices.**(BL1-Remember)**<br>**CO2-** To Understand the Basic concept of operating system, working of MS PowerPoint software and working of MS PowerPoint software .**(BL2-Understand)**<br>**CO3-** To Apply concept to identify type of software, Create formula using MS Excel Tool**(BL3-Apply)**<br>**CO4-** To Analyze Various softwares , Analyze the data by using statistical functions using MS- Excel tool and with absolute and relative cell references using MS-Excel tool**(BL4-Analyze)**<br>**CO5-** To evaluate and summarize the performance of various operating system, graphs and tables created in Microsoft Excel , equations and sample calculations .**(BL5-Evaluate)**<br>**CO6-** To Create various documents newsletters, brochures, making document using photographs, charts, presentation, documents, drawings and other graphic images.**(BL6-Create)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit-1 | Basics of Computer Systems, Hardware Components, Evolution of Computers, Computer Generations, Classification of Computers, Computer Applications, Interaction between User and Computer, Basic Computer Organization, Input and Output Devices, Central Processing Unit, System Bus Architecture, Memory or Storage Unit. | Lectures with whiteboard/PPT,PBL | 10 |
| Unit-2 | Software Types: Software and its Need, Types of Software - System software, Application software, System Software, Utility Program, Operating System: DOS, Windows, Linux etc., Firmware. | Lectures with whiteboard/PPT,PBL | 9 |
| Unit-3 | Creating word documents; The word window, Entering Text. Editing Document text; Selecting Text, Copying and Moving Text. Applying Text Enhancements; Applying Fonts and Font Styles in Word, Highlighting Text For Distinctive Look. Aligning and Formatting ; Aligning Text, Using Indentation Options, Setting Line Spacing Options, Using Tabs. Creating Lists, Numbers and Symbols; Numbering and Bullets, Creating Special Characters. Replacing and checking Text; Creating and Applying Frequently Used Text, Finding and Replacing Text, More about Spelling and Grammar, Using the Thesaurus Command. Getting Into Print; Using Print Preview, Changing Page Orientation and Paper Size, Aligning Text Vertically, Setting Margins, Printing Options. | Lectures with whiteboard/PPT,PBL | 10 |
| Unit-4 | Creating a Basic Presentation, Modifying Visual Elements, Formatting and Checking Text, Adding Objects, Applying Transitions, Animation Effects and Linking, Preparing handouts, Taking the Show on the Road. | Lectures with whiteboard/PPT,PBL | 8 |
| Unit-5 | Entering and Editing Cell Entries ; The excel Application Window , Workbooks and Worksheets, Moving the Cell Pointer, Entering Text and Numbers , Revising Text and Numbers. Working with Numbers; Creating Formulas, Formatting numbers. Changing Worksheet Layout ; Adjusting Column Width and Row Height, Inserting and Deleting Rows and Columns, Inserting and Deleting Cells , Moving and Copying Cell Contents , Naming a Worksheets , Selecting Worksheets , Copying and Moving Worksheets, Inserting and Deleting Worksheets, Other Formatting Options ; Aligning Text , Border and Color. Printing in Excel; Print Preview, Changing Page Setup, Checking Worksheet Spelling | Lectures with whiteboard/PPT,PBL | 8 |

## Part C

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | Sinha, P.K. Fundamentals of Computers. Prentice Hall of India |
| **Articles** | |
| **References Books** | Rajaraman, V. Fundamentals of Computers. Prentice Hall of India. |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 2 |
| CO2 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | 3 | 2 | 1 |
| CO3 | - | 1 | - | - | - | - | - | - | - | - | - | - | 3 | 2 | - |
| CO4 | - | - | - | 2 | - | - | - | - | - | - | - | - | 2 | 2 | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | 1 | - | 2 | 2 | - |
| CO6 | - | - | - | 1 | - | - | - | - | - | - | - | 2 | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Web Technologies |
| **Course Code** | BCA102[P] |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 1st | **Semester** | 1st | **Credits** | L | T | P | C |
| | | | | | 0 | 0 | 2 | 2 |
| **Course Type** | Lab only | | | | | | | |
| **Course Category** | Disciplinary Minor | | | | | | | |
| **Pre-Requisite/s** | basic knowledge computer file system. | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** To remember various Web Development Strategies and syntax rules of web Programming**(BL1-Remember)**<br>**CO2-** To understand the basics of web architecture, Types of architecture, knowledge about web protocols and web development tools.**(BL2-Understand)**<br>**CO3-** To implement: HTML, CSS, Javascript and XML web designing language to create Web pages.**(BL3-Apply)**<br>**CO4-** To analyze various Client-side programming techniques and introduction of CSS for styling of the web page.**(BL4-Analyze)**<br>**CO5-** To evaluate the web pages and layout with the help of Advanced CSS Techniques**(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✓<br>Employability ✓<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG1(No poverty)<br>SDG2(Zero hunger)<br>SDG3(Good health and well-being)<br>SDG4(Quality education)<br>SDG6(Clean water and sanitation)<br>SDG7(Affordable and clean energy)<br>SDG10(Reduced inequalities)<br>SDG12(Responsible consuption and production)<br>SDG13(Climate action)<br>SDG14(Life below water)<br>SDG15(Life on land) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| 1 | Prerequisite: basic knowledge computer file system. Introduction to Web Development: Web Development Strategies ,Websites for individual and Corporate World, Cyber Laws, Web Applications, Writing Web Projects, Identification of Objects, Target Users, Web Team, Planning and Process Development. Web Essentials: Concept of WWW, Internet and WWW, HTTP Protocol: Request and Response. | Lectures | 10 |
| 2 | Web Page Designing HTML: list, table, images, forms, Basics of HTML, formatting and fonts, commenting code, color, hyperlink, list, forms, XHTML, Meta tags, Character entities, frames and frame sets, Browser architecture and Web site structure. Overview and features of HTML5 | Experiments | 10 |
| 3 | Style Sheets CSS-Introduction to Cascading Style Sheets, Features, Core Syntax, Style Sheets and HTML Style Cascading and Inheritance, Text Properties, Box Model, Normal Flow Box Layout, colors and properties, manipulating texts, using fonts, borders and boxes, margins, padding lists, positioning using CSS, CSS2, Overview and features of CSS3 | Experiments | 8 |
| 4 | Scripting Java script: Introduction, documents, forms, statements, functions, objects; event and event handling; Introduction to client and server side scripting,data types, operators, conditional statement, loops in Java script, functions, arrays, objects and elements in Java script, form validation using Java script., | PBL | 9 |
| 5 | Introduction to XML, uses of XML, simple XML, XML key components, DTD and | PBL | 9 |

## Part C

| Modules | Title | Indicative-ABCA/PBL/ Experiments/Field work/ Internships | Bloom's Level | Hours |
|---|---|---|---|---|
| 1 | Create a specimen of corporate web page. Divide the browser screen into two frames. The frame on the left will be a menu consisting of hyper links. Clicking on any of these link will lead to a new page, which must open in a target frame which is on right side. | Experiments | BL2-Understand | 10 |
| 2-3 | Write a java script code block, which validates a user name and password against hard coded values. If either name or password field is not entered display an error message showing “You forgot one of the required fields. Please try again” In case the field matched do not match the hard coded values, display an error message showing : “Please enter a valid user name and password” If the field entered matched , Display the following message: “Welcome (Username)”. | Experiments | BL3-Apply | 10 |
| 4-5 | Intelligent Tourist Guide: Nowadays people use mobile phones and other mobile devices. Most of us have a small computing device that is always with us. People use it example for calling, as calendar and organizer. Mobile devices with GPS receiver are also used to find paths in navigation. The main idea of this thesis was to design a system that will run on most of phones and palms and will be helpful when visiting some new places and cities. | PBL | BL5-Evaluate | 30 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | Jackson, J. C. (2020). Web Technologies: A Computer Science Perspective. Prentice Hall.Science Perspective; |
| **Articles** | |
| **References Books** | Bayross, I. (2019). Web Enabled Commercial. BPB Publications. Applications Development using HTML, DHTML, JavaScript, Perl CGI |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | 3 | 2 | - | - | - | - | - | - | - | 1 | - | 1 |
| CO2 | - | 1 | 1 | 1 | 3 | - | - | - | - | - | - | - | 2 | - | 3 |
| CO3 | 2 | 1 | - | 1 | 1 | - | - | - | - | - | - | - | 3 | 2 | 3 |
| CO4 | 1 | 2 | 1 | 1 | 1 | - | - | - | - | - | - | - | 2 | 3 | 3 |
| CO5 | - | 1 | - | - | 1 | - | - | - | - | - | - | - | 2 | 2 | 3 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | NCC |
| **Course Code** | NCC0101[P] |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 1st | **Semester** | 1st | **Credits** | L | T | P | C |
| | | | | | 0 | 0 | 1 | 1 |
| **Course Type** | Lab only | | | | | | | |
| **Course Category** | Generic Elective | | | | | | | |
| **Pre-Requisite/s** | Should be acquainted with the basics knowledge of General Awareness about Leadership Quality, Personality Development, Defense system etc. | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Perform foot drill and follow the different word of command. **(BL1-Remember)**<br>**CO2-** Fire a weapon effectively with fair degree of marksmanship**(BL2-Understand)**<br>**CO3-** Undertake point to point navigation and take part in route marches by day and night. **(BL4-Analyze)**<br>**CO4-** Perform the social services on various occasions for better community & social life**(BL3-Apply)** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✓<br>Environment ✕ | | **SDG (Goals)** | SDG3(Good health and well-being)<br>SDG4(Quality education)<br>SDG17(Partnerships for the goals) | | | | |

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1. Drill | Foot Drill- Drill ki Aam Hidayaten, Word ki Command, Savdhan, Vishram, Aram Se, Murdna, Kadvar Sizing, Teen Line Banana, Khuli Line, Nikat Line, Khade Khade Salute Karna Parade Par, Visarjan, Line Tod, Tej Chal, Tham aur Dhire Chal, Tham. | Audio/Video clips, group discussion, lecture with ppt, quiz | 12 |
| Unit 2. Weapon Training (WT) | Introduction & Characteristics of .22 rifle, Handling of .22 rifle. | Whiteboard, PPT, Video Case Study, Project Based Activity, Application Based Activity | 5 |
| Unit 3. Map Reading (MR) | Definition of Map, Conventional signs, Scale and Grid System, Topographical forms and technical terms, Relief, Contours and gradients, Cardinal points and types of North, Magnetic Variation and Grid Convergence. | Whiteboard, PPT, Video Case Study, Project Based Activity, Application Based Activity | 3 |
| Unit 4. Field Craft & Battle Craft (FC & BC) | Introduction of Field Craft & Battle craft, Judging Distance, Method of Judging Distance. | Whiteboard, PPT, Video Case Study, Project Based Activity, Application Based Activity | 3 |
| Unit 5. Social Service and Community Development (SSCD) | Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc. | Whiteboard, PPT, Video Case Study, Project Based Activity, Application Based Activity | 7 |

## Part D(Marks Distribution)

| **Theory** | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 40 | 12 | 60 | |

## Part E

| | |
|---|---|
| **Books** | R Gupta ; NCC National Cadet Corps A, B & C Certificate Examination Book; Ramesh Publishing House, 2018. |
| **Articles** | |
| **References Books** | Singh, Neeraj; A Hand Book of NCC; Kanti Prakashan Publisher |
| **MOOC Courses** | |
| **Videos** | https://www.youtube.com/watch?v=iXzGjyk1wOw |

Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | NCC |
| **Course Code** | NCC0101[T] |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 1st | **Semester** | 1st | **Credits** | L | T | P | C |
| | | | | | 2 | 0 | 1 | 3 |
| **Course Type** | Embedded theory and field work | | | | | | | |
| **Course Category** | Disciplinary Minor | | | | | | | |
| **Pre-Requisite/s** | Should be acquainted with the basics knowledge of General Awareness about Leadership Quality, Personality Development, Defense system etc. | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** To Remember about the history of NCC, its organization, and incentives of NCC for their career prospects and the concept of national integration and its importance.**(BL1-Remember)**<br>**CO2-** To Understand the concept of critical & creative thinking and the concept of self-awareness and emotional intelligence.**(BL2-Understand)**<br>**CO3-** To Acquire knowledge of duties and conduct of NCC cadets.**(BL3-Apply)**<br>**CO4-** To analyze the concept of team and its functioning.**(BL4-Analyze)**<br>**CO5-** To Evaluate the process of decision making & problem solving.**(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✓<br>Environment ✕ | | **SDG (Goals)** | SDG1(No poverty)<br>SDG6(Clean water and sanitation)<br>SDG15(Life on land) | | | | |

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1- NCC General (N) | History of NCC, Aims and Objectives of NCC. Organization &Training. NCC Song, Motto of NCC - Motivation of Cadets. | Lecture with ppt., Diagrams, Flowchart depiction on whiteboard during online/offline lectures, Audio/Video clips, discussion (questions & answers section) | 6 |
| Unit 2- NCC Organization | NCC as Organization, Incentives of NCC, Duties of NCC Cadet. NCC Camps: Types & Conduct. Preparation and participation. Rank of officers and cadets. | Whiteboard, PPT, Video Case Study, Project Based Activity, Application Based Activity | 6 |
| Unit 3- National Integration (NI) & Awareness | National Integration: Importance & Necessity, Factors Affecting National Integration, Unity in Diversity & Role of NCC in Nation Building, Threats to National Security | Audio/Video clips, group discussion, lecture with ppt, classroom presentations | 6 |
| Unit 4- Personality Development | Intra & Interpersonal skills - Self-Awareness- &Analysis, Empathy, Critical & creative thinking, Decision making and problem solving. | Lecture with ppt., Diagrams, Flowchart depiction on whiteboard during online/offline lectures, Audio/Video clips, Group discussion. | 6 |
| Unit 5- Social Service and Community Development | Basics of social service and its need, Types of social service activities, Objectives of rural development programs and its importance, NGO's and their contribution in social welfare, contribution of youth and NCC in Social welfare. | Lecture with ppt., Diagrams, Flowchart depiction on whiteboard during online/offline lectures, Audio/Video clips, Group discussion. | 6 |

## Part D(Marks Distribution)

| **Theory** | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | Cadets training handbook common subjects (2017), D.G NCC Delhi-110030 |
| **Articles** | https://indiancc.mygov.in/activity/snehahoro/article-on-ncc-camp-and-training/ |
| **References Books** | DG, NCC Training directive |
| **MOOC Courses** | |
| **Videos** | https://www.youtube.com/watch?v=Am1Cs0DHMZ4 |

Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Object Oriented Programming with C++ |
| **Course Code** | BCA -203(T) |

Part A

<table>
<tr><td rowspan="2">Year</td><td rowspan="2">1st</td><td rowspan="2">Semester</td><td rowspan="2">2nd</td><td rowspan="2">Credits</td><td>L</td><td>T</td><td>P</td><td>C</td></tr>
<tr><td>3</td><td>0</td><td>2</td><td>5</td></tr>
<tr><td>Course Type</td><td colspan="8">Embedded theory and lab</td></tr>
<tr><td>Course Category</td><td colspan="8">Disciplinary Major</td></tr>
<tr><td>Pre-Requisite/s</td><td colspan="3">knowledge of basic C Concept,data type,functions</td><td>Co-Requisite/s</td><td colspan="4"></td></tr>
<tr><td>Course Outcomes & Bloom's Level</td><td colspan="8">CO1- Revised the basics of Programming concepts like structured, unstructured & Object Oriented programming concepts..(BL1-Remember)<br>CO2- Understand the difference between C & C++ programming structure, logic with and without Object Oriented Programming.(BL2-Understand)<br>CO3- Implement the OOP concepts as practical like Polymorphisms, Inheritance, and DMA. (BL3-Apply)<br>CO4- Apply OOP concepts and their syntax like Class objects, Constructor, Polymorphism, inheritance and DMA.(BL3-Apply)<br>CO5- Evaluating the performance and difference of various concepts and logics of OOP with respect to problem domain.(BL5-Evaluate)</td></tr>
<tr><td>Coures Elements</td><td colspan="3">Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕</td><td>SDG (Goals)</td><td colspan="4">SDG1(No poverty)<br>SDG2(Zero hunger)<br>SDG4(Quality education)</td></tr>
</table>

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| I | Concepts of object oriented programming, Need of Object Oriented Programming, Characteristics of OOP: Classes & Objects, Inheritance, Data Hiding, Encapsulation, Polymorphism, Overloading, Classes and Structures, Classes and Unions Overview of C++, Compiling & Debugging C++ Program, Basics: Preprocessor Directives, Header files, Input and Output Streams, Cout, Cin, Comments, Type Casting. Creating class, Data member and member function. Creating objects and accessing member functions through objects. | Lecturing | 10 |
| II | C++ streams, Formatted I/O: Formatting using the ios members, Setting and clearing the format flags, using manipulators to format I/O, Creating your own manipulators. Introduction to Constructor, Parameterized constructor, Multiple constructors, Default arguments constructor, Copy constructor, Destructor. Friend function, Friend classes, Inline function, Scope resolution operator, Static class members: Static data member, Static member function, passing objects to function, Returning objects, Object assignment. | Lecturing,Experiment | 9 |
| III | Function overloading, Function Signature. Overloading constructor function, finding the address of an overloaded function Operator Overloading: Overloading Unary Operators, Operator Keyword, Operator Arguments, Overloading Binary Operators: Arithmetic Operators, Concatenating Strings, Comparison Operators, Assignment Operators, Overloading Using friend function, Overloading Special Operators: New, Delete, <<. | Lecturing,Experiment | 8 |
| IV | Inheritance: Base & Derived class, Accessing Base Class ember, Specifying Derived Class, Protected Specifier, and Overriding Member Function. Virtual Functions, Pure Virtual Functions, Virtual Base Class, Late Binding, this pointer, Accessing Member data with this pointer. Abstract base class, Public and Private Inheritance, Levels of Inheritance. | Lecturing,Experiment | 10 |
| V | Containership: Classes within Classes Pointers: Address of Operator &, Pointer variable, Pointers and Arrays, Pointers and Functions, passing variables, Arrays, Pointer and Strings, Memory Management using new and delete, pointers to Objects: reference to members. Exception handling in CPP: types of exception handling. Command Line Arguments. | Lecturing,Experiment | 8 |

Part C

| Modules | Title | Indicative-ABCA/PBL/ Experiments/Field work/ Internships | Bloom's Level | Hours |
|---|---|---|---|---|
| II-V | Write separate functions to swap 2 integers making use of (i) pointer parameters and (ii) reference parameters (iii) constant data member 2 Create a class called Counter that contains a static data member to count the number of Counter objects being created. Also define a static member function called showCount() which displays the number of objects created at any given point of time. Which displays the number of objects created at any given point of time. 3 Define a class to represent a Bank account. Include the following members. a. Data members:- b. Name of the depositor c. Account number. d. Type of account. e. Balance amount in the account. f. Rate of interest (static data) 4 Provide a default constructor, a parameterized constructor and a copy constructor to this class. a. Also provide Member Functions:- 1.To deposit amount. 2.To withdraw amount after checking for minimum balance. 3.To display all the details of an account holder. 4.Display rate of interest (a static function) 5 Write an overloaded function called compute Area which is used to compute the area of a triangle, a rectangle and a circle, respectively. Show the invocation of these functions in the main. 6. Write a C++ class that contains two classes' car and track. The car class contains two private variables passengers and speed. The track class contains two private variables load and speed. Use friend function to compare the speed 7. A file contains a list of names and telephone numbers in the following form: Name Tel. No. Write a C++ program to read the file and output the list in the tabular format. The name should be left-justified and numbers right-justified. Use a class object to store each set of data. Program should also perform following tasks. i) To determine the telephone numbers of the specified person. ii) To determine the name if a telephone number is given. | Experiments | BL3-Apply | 10 |
| II-V | Create PBL on any given Topic 1. CGPA Calculator 2. Rock Paper Scissor 3. Casino Number Guessing Game 4. Calculator for Scientific Operations 5. Login and Registration System 6. Student Database Management System 7. Inventory System 8. Payroll System 9. Banking System 10. Medical Information System 11. Stock Management System 12. Hospital Management System 13. School Management System 14. Hotel | PBL | BL3-Apply | 20 |

| | | | | |
|---|---|---|---|---|
| | Management System 15. Library Management System 16. Traffic Management System 17. Trading Application 18. Snake Game 19. Tic-Tac-Toe 20. Phonebook Application | | | |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | Stroustrup, B. (2013). The C++ Programming Language (4th ed.). Addison-Wesley. Balagurusamy, E. (2018). Object-Oriented Programming with C++ (6th ed.). McGraw-Hill Education. |
| **Articles** | |
| **References Books** | Lafore, R. (2002). Object-Oriented Programming in C++ (4th ed.). Pearson Education. |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | - | - | - | 2 | 2 | - | - | - | - | - | - | 2 | 2 | 2 |
| CO2 | 1 | 1 | 1 | 2 | 2 | 2 | - | - | - | - | - | - | 2 | 2 | 3 |
| CO3 | 2 | 1 | 1 | - | 1 | - | - | - | - | - | - | - | 2 | 3 | 2 |
| CO4 | 2 | 1 | - | 2 | 1 | - | - | - | - | - | - | - | 3 | 2 | 3 |
| CO5 | 1 | - | - | 2 | 1 | - | - | - | - | - | - | - | 2 | 2 | 2 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Computer Assembling and Repair |
| **Course Code** | BCA -206 |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 1st | **Semester** | 2nd | **Credits** | L | T | P | C |
| | | | | | 0 | 0 | 1 | 1 |
| **Course Type** | Lab only | | | | | | | |
| **Course Category** | Disciplinary Minor | | | | | | | |
| **Pre-Requisite/s** | | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** To remember various concept of Information Technology, Computer System, various peripherals, I/o devices, and storage devices.**(BL1-Remember)**<br>**CO2-** To Understand the Basic concept of operating system, working of MS PowerPoint software and working of MS PowerPoint software .**(BL2-Understand)**<br>**CO3-** To Apply concept to identify type of software, Create formula using MS Excel Tool**(BL3-Apply)**<br>**CO4-** To Analyze Various softwares , Analyze the data by using statistical functions using MS- Excel tool and with absolute and relative cell references using MS-Excel tool**(BL4-Analyze)**<br>**CO5-** To evaluate and summarize the performance of various operating system, graphs and tables created in Microsoft Excel , equations and sample calculations .**(BL5-Evaluate)**<br>**CO6-** To Create various documents newsletters, brochures, making document using photographs, charts, presentation, documents, drawings and other graphic images.**(BL6-Create)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✓<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1 | Introduction to PC Hardware: Study of basic I/O systems, Types of Memories- Static RAM and Dynamic RAM, ROM, PROM, EPROM, | Lecturing | 9 |
| Unit 2 | Motherboard and Processor: Study of different types of Motherboards, Motherboard Configuration, Identifying Internal and External connectors, Types of data cables, Types of Processor- Intel Pentium IV, Dual core, Core 2 Duo, Quad processor etc,. Documents - Using Macros, Quick parts, and Content Links - Using Fields, Forms and Indexes. | Lecturing | 8 |
| Unit 3 | BIOS Configuration: Study of BIOS Set-up- Advance set-up, Boot configuration, Boot Menu. Installation of OS (Operating Software): Windows XP, installation of different types of Service Packs, Vista and Windows-7 etc. | Lecturing,Experiment | 9 |
| Unit 4 | Hard Disk: Formatting of Hard disk, Partitioning of Hard disk in different logical drives, Disk defragmentation, Disk clean up, Scan disk etc,. Installation of Device Drivers: Different types of Motherboard drivers, LAN, Audio, and Video. | Lecturing,Experiment | 8 |
| Unit 5 | Configuration of External devices: Physical set-up of Printers- Performing test print out, Printing of document etc, Scanner set-up, Webcam, Bluetooth device, Memory card reader etc. Diagnostic and troubleshooting of PC: POST (Power on Self Test), identifying problems by Beep codes errors, checking power supply using Multi-meter, Replacement of components etc. Configuration of External devices: Physical set-up of Printers- Performing test print out, Printing of document etc, Scanner set-up, Webcam, Bluetooth device, Memory card reader etc. Maintenance of PC. | Lecturing,Experiment | 9 |

Part C

| Modules | Title | Indicative-ABCA/PBL/ Experiments/Field work/ Internships | Bloom's Level | Hours |
|---|---|---|---|---|
| II-V | Write separate functions to swap 2 integers making use of (i) pointer parameters and (ii) reference parameters (iii) constant data member 2 Create a class called Counter that contains a static data member to count the number of Counter objects being created. Also define a static member function called showCount() which displays the number of objects created at any given point of time. Which displays the number of objects created at any given point of time. 3 Define a class to represent a Bank account. Include the following members. a. Data members:- b. Name of the depositor c. Account number. d. Type of account. e. Balance amount in the account. f. Rate of interest (static data) 4 Provide a default constructor, a parameterized constructor and a copy constructor to this class. a. Also provide Member Functions:- 1.To deposit amount. 2.To withdraw amount after checking for minimum balance. 3.To display all the details of an account holder. 4.Display rate of interest (a static function) 5 Write an overloaded function called compute Area which is used to compute the area of a triangle, a rectangle and a circle, respectively. Show the invocation of these functions in the main. 6. Write a C++ class that contains two classes' car and track. The car class contains two private variables passengers and speed. The track class contains two private variables load and speed. Use friend function to compare the speed 7. A file contains a list of names and telephone numbers in the following form: Name Tel. No. Write a C++ program to read the file and output the list in the tabular format. The name should be left-justified and numbers right-justified. Use a class object to store each set of data. Program should also perform following tasks. i) To determine the telephone numbers of the specified person. ii) To determine the name if a telephone number is given. | Experiments | BL3-Apply | 10 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | Alexander, M., & Kusleika, R. (2015). Access 2016 Bible. John Wiley & Sons. |
| **Articles** | Berk, K. N. (2006). Data Analysis with Microsoft Excel. |
| **References Books** | |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | - | - | - | 1 | - | - | - | - | - | - | 1 | 2 | 3 | 2 |
| CO2 | 2 | 3 | - | - | 2 | - | - | - | - | 1 | - | 1 | 2 | 1 | 2 |
| CO3 | 2 | 2 | 3 | 1 | 3 | - | - | - | - | - | 1 | 2 | 2 | 2 | 1 |
| CO4 | 2 | 3 | 2 | 3 | 3 | - | - | - | - | 2 | - | 2 | 3 | 2 | 2 |
| CO5 | 2 | 3 | 2 | 3 | 3 | 2 | - | - | 1 | 2 | 2 | 2 | 3 | 2 | 2 |
| CO6 | 2 | 2 | 3 | 2 | 3 | - | - | - | - | 3 | 2 | 3 | 2 | 1 | 3 |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Health and Wellness |
| **Course Code** | BCA 207 |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 1st | **Semester** | 2nd | **Credits** | L | T | P | C |
| | | | | | 0 | 0 | 2 | 2 |
| **Course Type** | Lab only | | | | | | | |
| **Course Category** | Ability Enhancement Courses | | | | | | | |
| **Pre-Requisite/s** | Successful high school completion of Dynamics of Health Care in Society | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Know the concept of health &Wellness **()**<br>**CO2-** Discuss the mind –body relationship**()**<br>**CO3-** Understand the global health issues & Illustrate the Health beliefs in your country .**()**<br>**CO4-** Analyze the sanitation services in your locality**()**<br>**CO5-** Evaluate a mass media program of health awareness**()** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✓<br>Environment ✕ | | **SDG (Goals)** | | | | | |

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit-1 | • Definition & meaning of the term health. • Importance of health in everyday life. •Components of health – physical, mental , spiritual and its importance. | Yoga,Quiz,Sports | |
| Unit-2 | Concept of wellness. • Mental health & wellness. • Determinants of health • Role of mass media for health promotion. . | Yoga,Quiz,Sports | |
| Unit-3 | Health concept of mind body relation . • Implication of mind body connections. • Concept of wellbeing. • Digital Wellbeing. | Yoga,Sports | |
| Unit-4 | • Understanding health beliefs. • Promoting Human strength & life and enhancement. • Classification of human strength. • Cultivating inner strength Global Health Issues | Yoga,Sports | |
| Unit-5 | Communicable, Non-Communicable disease and their prevention • Malnutrition, Food Adulteration, Environmental Pollution and Sanitation, Population and their management. • Physical Activity and Nutrition, Overweight and Obesity, Mental Health | Yoga,Sports,Debate | |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | Puri .k. Chandra S.S (2005) “Health and Physical Education” New Delhi : Surjeet Publication |
| **Articles** | |
| **References Books** | |
| **MOOC Courses** | |
| **Videos** | |

Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | - | - | - | 1 | - | - | - | - | 2 | - | - | 3 | - | - |
| CO2 | - | - | - | - | - | - | 1 | - | - | - | 2 | - | - | 3 | - |
| CO3 | 1 | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - |
| CO4 | - | 1 | 2 | - | - | - | - | - | - | - | - | - | 1 | 3 | - |
| CO5 | - | 1 | - | 2 | - | - | - | - | - | - | - | - | - | 2 | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Operating Systems |
| **Course Code** | BCA- 202 |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 1st | **Semester** | 2nd | **Credits** | L | T | P | C |
| | | | | | 3 | 0 | 0 | 3 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Discipline Core | | | | | | | |
| **Pre-Requisite/s** | Operating system is the software that supports a computer's basic functions, such as scheduling tasks, executing applications, and controlling peripherals. Specific topics covered include: ● Introduction to Operating Systems ● CPU Scheduling Concepts ● Concurrent Processes ● Memory Management | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Remember the role of Operating System , basics of operating systems like kernel, shell, types and views of operating systems.**(BL1-Remember)**<br>**CO2-** Understand CPU Scheduling, Synchronization, Deadlock Handling and Comparing CPU Scheduling Algorithms .**(BL2-Understand)**<br>**CO3-** Apply the various CPU scheduling algorithms, remove deadlocks segmentation and paging techniques **(BL3-Apply)**<br>**CO4-** Analyze theory and implementation of: processes, resource control (concurrency etc.), physical and virtual memory, scheduling, I/O and files.**(BL4-Analyze)**<br>**CO5-** Evaluating the various characteristics of mutual exclusion, critical section, Peterson solution and other inter process communication techniques.**(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG1(No poverty)<br>SDG2(Zero hunger)<br>SDG4(Quality education)<br>SDG8(Decent work and economic growth) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit-1 | Introduction: Operating system objectives and functions, Interaction of O. S. & hardware architecture, Evolution of operating systems, Operating System Structure- Layered structure, System Components, Operating System services, Reentrant Kernels, Monolithic and Microkernel Systems. | Lecturing | 8 |
| Unit-2 | Inter Process Communications and Process: Process Concepts, Process Control Blocks, Producer / Consumer Problem, Mutual Exclusion, Critical Section Problem, Peterson's solution, Semaphores, Test and Set operation; Monitors, Classical Problem and solutions in Concurrency- Dining Philosopher Problem. Inter Process Communication models and Scheme | Lecturing | 7 |
| Unit-3 | Process Scheduling and Deadlock: Context Switching, CPU Schedulers, Scheduling criteria; Scheduling algorithms: First Come First Serve, Round Robin, Shortest Job First, Shortest Run Time First, Priority algorithm. Thread concept and multithreaded O.S., Deadlock: System model, Deadlock characterization, Prevention, Avoidance and detection, Recovery from deadlock | PBL | 7 |
| Unit-4 | Memory Management: Need of Memory management, Compile Time and Run Time Binding, Swapping, Logical and Physical Address Space, MMU, Contiguous Memory Allocation, Internal and External Fragmentation, Non-Contiguous Memory 5 Allocation, Paging, Segmentation, Segmentation with Paging Virtual Memory: Page replacement algorithms namely, Least recently used, Optimal page replacement, First in First out, Belady's anomaly. | PBL | 8 |
| Unit-5 | I/O Management, Disk Scheduling, and File System: I/O Devices, Organization of I/O functions, I/O Buffering; Disk Scheduling: FCFS, SCAN, C-SCAN, Look, C-Look and SSTF; File concept, File organization and access mechanism, File directories, and File sharing, File system protection and security | PBL | 8 |

Part C

# BCA II Sem

# PBL Operating System (BCA-202)

## 1. Implement CPU Scheduling Algorithms

This project involves implementing various CPU scheduling algorithms, such as First-Come, First-Served (FCFS), Shortest Job First (SJF), and Round Robin (RR), to understand how operating systems allocate CPU time to processes.

Through this project, you will gain insights into how different scheduling algorithms impact process execution order, efficiency, and system performance.

Duration: 15 hours

Project Complexity: Easy

Learning Outcome: Understanding of CPU scheduling algorithms and their impact on system performance

Portfolio Worthiness: Yes

Required Pre-requisites:

Proficient in a programming language (C/C++ recommended)
Basic understanding of operating system concepts
Familiarity with process management

Resources Required:
Access to a programming environment (IDE or text editor and compiler)
Documentation or textbook on operating systems for algorithm details
Optionally, simulation tools for visualizing algorithm performance

Real-World Application:
Forms the basis for designing efficient multi-tasking and multi-processing systems.
Critical for optimizing performance in operating systems, real-time systems, and cloud computing platforms.

## 2. Simple Memory Manager

## 2. Simple Memory Manager

This project involves developing a simple memory manager that simulates the allocation and deallocation of memory in a system. Through this project, you will learn about dynamic memory allocation strategies and how operating systems manage memory resources.
Duration: 25 hours

Project Complexity: Medium

Learning Outcome: Understanding of dynamic memory allocation and memory management techniques

Portfolio Worthiness: Yes

Required Pre-requisites:

Strong programming skills, preferably in C or C++
Basic understanding of data structures (e.g., GitHubed lists, trees)
Familiarity with operating system concepts, especially memory management

Resources Required:
Development environment capable of compiling and running C/C++ programs
Documentation of memory management techniques and algorithms
Debugging tools to test and verify memory allocation/deallocation

Real-World Application:
Essential for developing applications that require efficient memory usage.
Understanding memory management is crucial for optimizing software performance and resource utilization.

## 3. Basic Process Manager

This project is focused on creating a basic process manager that can create, execute, and monitor simple processes. Through this project, you will learn about the process lifecycle, including creation, execution, and termination, as well as basic process monitoring in operating systems.
Duration: 20 hours

Project Complexity: Medium

## Part D(Marks Distribution)

Learning Outcome: Understanding of process lifecycle and basic process monitoring

**Theory**

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| 100 | 40 | 60 | 18 | 40 | |

Portfolio Worthiness: Yes

Required Pre-requisites:

Basic programming knowledge, preferably in Python or C
Understanding of operating system concepts, particularly processes
Familiarity with using system calls or external libraries for process management

**Practical**

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|

Resources Required:
A programming environment for Python or C
Access to operating system APIs for process management
Documentation for the programming language and libraries used

Real-World Application:
Builds foundational skills for developing system monitoring tools.
Essential for understanding how operating systems manage and schedule processes.

## Part E

| | |
|---|---|
| **Books** | Silberschatz, A., & Galvin, P. B. (1999, January 1). Operating System Concepts. John Wiley & Sons. |
| **Articles** | |
| **References Books** | Deitel, H. M., Deitel, P. J., & Choffnes, D. R. (2004, January 1). Operating Systems. Prentice Hall. |
| **MOOC Courses** | |
| **Videos** | - |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | - | - | - | 2 | - | - | - | - | 2 | - | - | 1 | 2 | 1 |
| CO2 | 1 | 2 | - | 2 | 2 | 2 | - | - | - | 2 | - | - | 2 | - | 3 |
| CO3 | 2 | 1 | - | - | 1 | 2 | - | - | - | - | - | - | 3 | 2 | 3 |
| CO4 | 2 | 2 | - | 2 | 2 | - | - | - | - | - | - | - | 2 | 3 | 3 |
| CO5 | 2 | 2 | - | 2 | 2 | - | - | - | - | - | - | - | 2 | 2 | 3 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

### 4. Dynamic Memory Tool

This project involves creating a tool that dynamically analyzes and visualizes memory usage of applications in real-time. Through this project, you will learn about memory profiling, dynamic memory allocation, and how to detect memory leaks and inefficiencies in applications.
Duration: 25 hours

Project Complexity: Medium

Learning Outcome: Understanding of memory profiling, detection of memory leaks, and dynamic memory allocation

Portfolio Worthiness: Yes

Required Pre-requisites:

Advanced programming skills, especially in C, C++, or any language that allows low-level memory management
Understanding of operating system memory management concepts
Familiarity with debugging and profiling tools

Resources Required:
Development environment for chosen programming language
Libraries or APIs for accessing memory usage information
Documentation of memory management and profiling techniques

Real-World Application:
Crucial for optimizing memory usage in software development, and improving application performance and efficiency.
Provides insights into application behavior, aiding in debugging and reducing memory-related issues.

# Syllabus-2023-2024

## (SOET)(BCA)

## Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Title of the Course** | Digital Computer Principles | | | | | | | |
| **Course Code** | BCA- 204 | | | | | | | |
| **Year** | 1st | **Semester** | 2nd | **Credits** | L | T | P | C |
| | | | | | 3 | 1 | 0 | 4 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Disciplinary Major | | | | | | | |
| **Pre-Requisite/s** | An attendee of this course should be familiar with the types of signals (Digital and Analog) and should have knowledge about Decimal number system and basics of Mathematics and must have logical aptitude. | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** the basic function and data flow in computers along with its major units participating in data transfers. Revisiting Decimal Number systems**(BL1-Remember)**<br>**CO2-** Will be able to understand The basics of Number system, Number representation in computer, working of Digital Circuits with cloak signals and minimizing the digital circuits. **(BL1-Remember)**<br>**CO3-** Will be able to apply the concepts to design the combinational and sequential circuits and minimizing the circuits.**(BL3-Apply)**<br>**CO4-** Will be able to analyze the circuits designed with respect to input signals and outputs generated and studying the working and comparing the circuits.**(BL4-Analyze)**<br>**CO5-** Will be able to Evaluate and investigate the performance of the digital circuits designed for different set of inputs**(BL5-Evaluate)**<br>**CO6-** Will be able to Design and build digital circuits (Combinational and Sequential) on simulators (logisim) and testing their working.**(BL6-Create)** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | | **SDG (Goals)** | | | | |

## 5. Basic Text Editor

This project involves creating a basic text editor that allows users to create, edit, and save text files. Through this project, you will learn about file I/O operations, user interface creation, and how operating systems handle file management.
Duration: 25 hours

Project Complexity: Medium

Learning Outcome: Understanding of file I/O operations, user interface creation, and file management

Portfolio Worthiness: Yes

Required Pre-requisites:

Basic programming knowledge, preferably in Python with Tkinter or Java with Swing

Understanding of file operations (open, read, write, close)
Basic knowledge of GUI development

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| 1 | Data types and Number systems, Binary number system, Octal & Hexadecimal number system,1's & 2's complement, Binary Fixed- Point Representation, Arithmetic operation on Binary numbers, Overflow & underflow, Floating Point Representation, Codes, ASCII, EBCDIC codes, Gray code, Excess-3 & BCD, Error detection & correcting codes. | Lecturing | 10 |
| 2 | Logic Gates, AND, OR, NOT GATES and their Truth tables, NOR, NAND & XOR gates, Boolean Algebra. | Lecturing | 7 |
| 3 | Basic Boolean Law's, Demorgan's theorem, MAP Simplification, Minimization techniques, K -Map, Sum of Product & Product of Sum. | Lecturing | 7 |
| 4 | Combinational Circuits: Half Adder & Full Adder, Full subtractor, Multiplexer, Demultiplexer, Encoder, Decoder. Sequential Circuits: Flip-flops - RS, D, JK & T Flip-flops | Lecturing | 8 |
| 5 | Sequential Circuits: Buffer register, Shift Registers (Right &Left Shift register, Bidirectional Shift register), Counters: Ripple counter, Binary Counter,MOD-10 Counter,Ring Counter. Concept of bus, data movement among registers. | Lecturing | 7 |

Resources Required:
Programming environment setup (e.g., Python IDLE, Eclipse for Java)
Libraries for GUI development (e.g., Tkinter for Python, Swing for Java)
Documentation on file handling and GUI components for the chosen language

Real-World Application:
Foundation for building more complex text and code editors.
Practical understanding of integrating file management with graphical user interfaces.

## Part C

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | Mano, M. M. (2020). Computer System Architecture. Prentice Hall of India. |
| **Articles** | Bartee, T. C. (1972). Digital Computer Fundamentals. Tata McGraw-Hill. |
| **References Books** | Bartee(2001). Digital Computer Fundamentals. TMH Publication. |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | 3 | 2 | - | - | - | - | - | - | - | - | - | 1 |
| CO2 | 2 | 2 | 1 | 1 | 2 | - | - | - | - | - | - | - | 3 | 2 | 3 |
| CO3 | 1 | 1 | 1 | - | 1 | - | - | - | - | - | - | - | 3 | 3 | 3 |
| CO4 | - | 2 | - | 2 | 1 | - | - | - | - | - | - | - | 3 | 2 | 3 |
| CO5 | - | 1 | - | - | 1 | - | - | - | - | - | - | - | 2 | 3 | 3 |
| CO6 | 1 | - | - | - | 2 | - | - | - | 1 | - | - | - | 2 | 3 | 3 |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Data Structure |
| **Course Code** | BCA-201(T) |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 1st | **Semester** | 2nd | **Credits** | L | T | P | C |
| | | | | | 3 | 0 | 2 | 5 |
| **Course Type** | Embedded theory and lab | | | | | | | |
| **Course Category** | Disciplinary Major | | | | | | | |
| **Pre-Requisite/s** | To understand the contents and successfully complete this course, a participant must have a basic understanding of Storage Systems, Operating systems, Networking and Database. | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Understanding: comprehensive knowledge of the data structures;**(BL1-Remember)**<br>**CO2-** Applying: understand the importance of data and be able to identify the data requirements for an application;**(BL2-Understand)**<br>**CO3-** Analyzing: have a practical experience of algorithmic design and implementation; **(BL3-Apply)**<br>**CO4-** Evaluating: practical experience of developing applications that utilize data structures and evaluating the performances of applications;**(BL4-Analyze)**<br>**CO5-** Creating: develop projects requiring the implementation of various data structures**(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG4(Quality education) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| 1 | Overview of Data Structure: Definition, types, various operations and applications (T1,T3,T10) , Arrays (T1,T4,T7): Linear Array, Operations on Linear Array, Multidimensional Array, Sparse Matrices; Strings . | LECTURE | 10 |
| 2 | Stack: contiguous implementation of stack, various operations on stack, Applications of stack: Infix, postfix and prefix conversions Queue: Linear queue, various operations on queue, its drawback; circular queue | EXPERT LECTURE | 10 |
| 3 | General List: Singly linked list-operations on it; doubly linked list, circular linked list. | ROLE PLAY | 10 |
| 4 | Searching: sequential search, binary search, Sorting(: Bubble sort, selection sort, insertion sort, merge sort, Quick Sort | GROUP DISCUSSION | 10 |
| 5 | Trees: Definitions: height, depth, order, degree, parent and child relationship etc; Binary tree- complete binary tree, almost complete binary tree Graph(: Related Definitions: graph representations | LECTURE | 5 |

Part C

# PBL ON DATA STRUCTURE

## Library Management System

- **Data Structures:** Linked Lists, Stacks, Queues, Trees (e.g., AVL Trees for indexing).
- **Project Overview:** Design and implement a system to manage book borrowing, returning, and inventory.
- **Tasks:**
- Implement a linked list to manage the catalog of books.
- Use stacks to handle book borrowing and returning history.
- Implement queues for managing waitlists for popular books.
- Use a tree structure for efficient search and categorization of books.

## 2. Social Network Analysis

- **Data Structures:** Graphs, Hash Tables.
- **Project Overview:** Analyze and model a social network to find connections, influencers, and communities.
- **Tasks:**
- Represent the network using an adjacency list or adjacency matrix.
- Implement algorithms to find the shortest path between users (e.g., Dijkstra's or BFS).
- Use hash tables to efficiently manage user data.
- Detect communities within the network using clustering algorithms.

## 3. E-commerce Recommendation System

- **Data Structures:** Hash Tables, Graphs, Trees (e.g., B-Trees for indexing).

- **Tasks:**
- Use linked lists to manage the sequence of messages.
- Implement Trie structures to allow fast search through the message history.
- Implement user management using hash tables.

## 9. Online Auction System

- **Data Structures:** Hash Maps, Heaps.
- **Project Overview:** Create an online platform for auctions with features like bidding and item management.
- **Tasks:**
- Use hash maps to manage auction items and user details.
- Implement heaps to manage bids and determine the highest bid efficiently.
- Develop real-time auction updates.

## 10. Hospital Management System

- **Data Structures:** Linked Lists, Queues, Trees.
- **Project Overview:** Design a system to manage patient records, doctor appointments, and hospital resources.
- **Tasks:**
- Use linked lists to maintain patient records.
- Implement queues to manage patient appointments.
- Use trees to classify and search medical records efficiently.

Part D(Marks Distribution)

**Theory**

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| 100 | 40 | 60 | 18 | 40 | |

**Practical**

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| 100 | 50 | 60 | 30 | 40 | |

Part E

| | |
|---|---|
| **Books** | Sahni, S. (1998). Data Structures, Algorithms, and Applications in C++. McGraw-Hill Companies. |
| **Articles** | |
| **References Books** | Horowitz, E., Sahni, S., & Anderson-Freed, S. (1993). Fundamentals of Data Structures in C. Computer Science Press. |
| **MOOC Courses** | |
| **Videos** | |

Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | - | - | - | - | - | - | - | - | - | - | - | 3 | 2 | 2 |
| CO2 | 2 | 3 | 1 | - | - | - | - | - | - | - | - | 2 | 2 | 2 | 1 |
| CO3 | 2 | 3 | 1 | - | - | - | - | - | - | - | - | 2 | 2 | 3 | 1 |
| CO4 | 3 | 3 | 1 | - | - | - | - | - | - | - | - | 2 | 2 | 3 | 1 |
| CO5 | 2 | 1 | - | - | - | - | - | - | - | - | - | 2 | 2 | 3 | 2 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

- Implement hash maps for efficient storage and retrieval of movie details.
- Design and implement user review and rating systems.

## 6. Memory Management Simulator

- **Data Structures:** Linked Lists, Arrays.
- **Project Overview:** Simulate memory allocation and deallocation in an operating system.
- **Tasks:**
  - Use linked lists to manage free and allocated memory blocks.
  - Implement algorithms for memory allocation (e.g., first fit, best fit).
  - Simulate fragmentation and defragmentation processes.

## 7. Flight Reservation System

- **Data Structures:** Graphs, Heaps.
- **Project Overview:** Build a system to manage flight reservations, cancellations, and route optimization.
- **Tasks:**
  - Represent flight routes using graphs.
  - Implement shortest path algorithms to find optimal routes.
  - Use heaps to manage reservation priority queues.

## 8. Chat Application with Searchable Message History

- **Data Structures:** Linked Lists, Trees (e.g., Trie for searching).
- **Project Overview:** Develop a chat application with searchable message history and user management.

- **Project Overview:** Build a system to recommend products based on user behavior and product features.
- **Tasks:**
  - Use hash tables to store user preferences and product details.
  - Implement collaborative filtering algorithms using graphs to find similar users.
  - Use tree structures to organize and search products efficiently.

| | |
|---|---|
| **Title of the Course** | Making of Modern India |
| **Course Code** | BCA-205 |

## 4. Real-Time Traffic Navigation System

- **Data Structures:** Graphs (for representing road networks), Priority Queues (for Dijkstra's algorithm).
- **Project Overview:** Develop a system that provides real-time navigation and traffic updates.
- **Tasks:**
  - Represent the road network as a graph with weighted edges.
  - Implement Dijkstra's algorithm to find the shortest path.
  - Use priority queues to efficiently manage the nodes during pathfinding.
  - Integrate real-time data to update traffic conditions.

## 5. Movie Database System

- **Data Structures:** Trees (e.g., AVL Trees, Red-Black Trees), Hash Maps.
- **Project Overview:** Create a searchable movie database with features like movie ratings, reviews, and genre classification.
- **Tasks:**
  - Use trees to index movies for quick search by title, genre, or rating.

Part A

| Year | 1st | Semester | 2nd | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2 | 0 | 0 | 2 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Discipline Core | | | | | | | |
| **Pre-Requisite/s** | 1. *Understanding of Indian Culture and History*: Before delving into the idea of India in a historical perspective, readers should have a foundational understanding of Indian culture, including its commonalities, diversities, and the concept of unity in diversity. Familiarity with cultural accommodations and conflicts within India's historical context is essential, along with an understanding of the role of Indian intelligentsia in shaping these concepts. 2. *Knowledge of Indian Nationalism's Foundations*: To grasp the emergence and growth of Indian nationalism, readers should be acquainted with its anti-colonial basis, economic nationalism, and the dynamics of communalism and nationalism. Understanding revivalism, Enlightenment values, and the influence of European nationalism on Indian nationalism provides crucial context. 3. *Awareness of Social Reform Movements*: Before studying social reform movements in India, readers should have knowledge of the British colonial rule's impact on Indian society and the introspection it prompted. Familiarity with key figures such as Raja Rammohan Roy, Swami Vivekananda, and the issues of women's rights and the caste system is necessary. 4. *Understanding of the Indian National Movement*: Readers should have a basic understanding of the Indian National Movement, including early revolts, the significance of the 1857 revolt, and the role of early nationalists. Knowledge of movements led by Gandhi, socialist and left trends, and the integration of princely states into the nation is crucial, as is an understanding of the partition and India's journey to independence. 5. *Knowledge of Post-Independence India*: To comprehend India after independence, readers should understand the making of the Indian Constitution and the post-independence Nehru era. Familiarity with India's experiences facing wars, its economic trajectory from planning to the liberalization, privatization, and | | | | | | |
| **Co-Requisite/s** | 1. *Understanding of Colonialism and Imperialism*: Before delving into Indian nationalism and social reform movements, readers should have a grasp of colonialism and imperialism, particularly their impact on India. Knowledge of how colonial powers governed and exploited colonized nations provides context for understanding the emergence of nationalist sentiments and the need for social reforms. 2. *Familiarity with Global History and Movements*: Readers should have a basic understanding of global history and movements, including the Enlightenment, industrialization, and the rise of nationalist movements worldwide. This broader perspective helps contextualize India's historical developments within the global framework of political and social change. 3. *Knowledge of Political Philosophy and Ideologies*: To comprehend Indian nationalism and the Indian National Movement, readers should be familiar with political philosophies and ideologies such as liberalism, socialism, and nationalism. Understanding these ideologies helps in analyzing the motivations, goals, and strategies of Indian nationalist leaders and movements. 4. *Awareness of Socio-Economic Structures*: Before studying post- | | | | | | |

| | | | |
|---|---|---|---|
| | globalization (LPG) era, along with its achievements and challenges in the 21st century, provides essential context for understanding contemporary India. | | independence India and its economic trajectory, readers should have an understanding of socio-economic structures and systems, including feudalism, capitalism, and socialism. This knowledge provides insights into the challenges and strategies involved in India's economic development and policy-making. 5. *Understanding of International Relations*: To understand post-independence India's experiences facing wars and its role in the global arena, readers should have a basic understanding of international relations theories and concepts. Knowledge of geopolitics, alliances, and global conflicts helps in analyzing India's foreign policy decisions and its place in the international community. |
| **Course Outcomes & Bloom's Level** | **CO1-** 1. : Students will gain a comprehensive understanding of India's historical evolution, including its cultural diversity, unity in diversity, accommodations, conflicts, and the role of the Indian intelligentsia. They will grasp how these factors shaped the idea of India, particularly in the context of British rule.**(BL2-Understand)**<br>**CO2-** 2. : Students will critically analyze the development of Indian nationalism, exploring its anti-colonial basis, economic nationalism, communalism, revivalism, and the influences of Enlightenment values and European nationalism. They will understand the complex factors contributing to the emergence and growth of Indian nationalism.**(BL4-Analyze)**<br>**CO3-** 3. Students will appreciate the significance of social reform movements in 19th-century India, understanding the contributions of key figures such as Raja Rammohan Roy and Swami Vivekananda. They will recognize the importance of addressing issues like women's rights and the caste system within the context of British rule and Indian introspection.**(BL5-Evaluate)**<br>**CO4-** 4. : Students will understand the dynamics of the Indian National Movement, including early revolts, the 1857 revolt, the role of early nationalists, Gandhi-led mass movements, socialist and left trends, and the integration of princely states. They will comprehend the complexities and strategies involved in India's journey to independence.**(BL2-Understand)**<br>**CO5-** 5. Students will analyze the trajectory of India after independence, examining the making of the Indian Constitution, the post-independent Nehru era, India's experiences facing wars, and its economic transition. They will evaluate India's achievements and challenges in the 21st century, gaining insights into its socio-economic and political landscape.**(BL3-Apply)** | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✓<br>Environment ✕ | **SDG (Goals)** | SDG1(No poverty)<br>SDG2(Zero hunger)<br>SDG3(Good health and well-being)<br>SDG4(Quality education)<br>SDG8(Decent work and economic growth)<br>SDG10(Reduced inequalities) |

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| 1 | Idea of India in historical perspective a) Indian culture, b) cultural commonness, c)cultural diversities, d)unity in diversity, e) culturall accomodations ,f) cultural conflicts, g)Idea of India and British Rule , h) Role of Indian Intelligentsia. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 5 |
| 2 | Emergence and growth of Indian Nationalism a) Anti-colonial basis ,b) Economic Nationalism ,c) communalism and nationalism ,d) revivalism and Indian nationalism ,e)Enlightenment values ,f)European Nationalism and Indian Nationalism | Lectures with whiteboard/PPT, Recorded video/interactive videos | 5 |
| 3 | Social Reform Movements a) British Rule and Indian introspection ,b)Raja Rammohan Roy, c) social reform movements in 19th century , d)Swami Vivekanand ,e)The women issue ,f)Caste system | Lectures with whiteboard/PPT, Recorded video/interactive videos | 5 |
| 4 | Indian National Movement a)Early Revolts and 1857 Revolt, b)Early Nationalists ,c) Bang Bhang Movement , d) Gandhi led Mass Movements, e) Socialist and Left trends , f) Princely States and their integration into nation, h)Partition and Independence . | Lectures with whiteboard/PPT, Recorded video/interactive videos | 5 |
| 5 | India after independence a)Making of Indian Constitution ,b) Post Independent Nehru Era , c) India facing Wars , d) Indian econmy- From Planning to LPG ,e) Achievements, f) Challenges in 21st century India. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 4 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | 1. Bipan Chandra and others: India's Struggle For Independence , Penguine Publishers. 2. Bipan Chandra: History Of Modern India, Orient Blackswan publishers. 3. Sunil Khilnani: The Idea of India, Penguine publishers. 4. Shekhar Bandopadhyay: From Plastic to Partition and After, A History of Modern India, Orient Blackswan publishers. 5. Rakesh Batabyal: The Penguine Book of Modern Indian Speeches,1878 to Present, Penguine Publishers. 6. A R Desai:Social Background of Indian Nationalism, Popular Prakashan . 7. B R Nanda: Mahatma Gandhi ,A Biography,London |
| **Articles** | |
| **References Books** | 1. B.R.Nanda:Gandhi and His Critics, Oxford 2. Girja Shankar: Socialist Trends in Indian National Movement ,Meerut 3. Urmila Phadnis:Towards the integration of Indian States,1919-1947,Mumbai 4. Bimal Prasad: Gandhi,Nehru and JP,A Study in Leadership,New Delhi 5. Bipan Chandra and others:India Since Independence ,Penguine 6. Ramchandra Guha:Makers of Modern India, Penguine. 7. Austin Granville: The Indian Constitution, Oxford. |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | 1 | - | 2 | - | - | - | - | - | - | - | 1 | 2 | 3 |
| CO2 | - | - | 1 | 2 | 3 | - | - | - | - | - | - | - | - | - | - |
| CO3 | 1 | - | - | - | - | - | - | - | - | - | - | - | 3 | 2 | - |
| CO4 | - | 1 | - | - | - | - | - | - | - | - | - | - | 1 | - | - |
| CO5 | - | - | 2 | - | - | - | - | - | - | - | - | - | 2 | 2 | 3 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | NCC |
| **Course Code** | NCC -0202 (T) |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 1st | **Semester** | 2nd | **Credits** | L | T | P | C |
| | | | | | 2 | 0 | 2 | 4 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Generic Elective | | | | | | | |
| **Pre-Requisite/s** | Should be acquainted with the basics knowledge of General Awareness about Leadership Quality, Personality Development, Defense system etc. | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Define thinking, reasoning, critical thinking and creative thinking.**(BL1-Remember)**<br>**CO2-** To think critically about different life related issues.**(BL2-Understand)**<br>**CO3-** Think divergently and will try to break functional fixedness.**(BL3-Apply)**<br>**CO4-** Creatively in their real-life problems.**(BL4-Analyze)** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✓<br>Environment ✕ | | **SDG (Goals)** | SDG3(Good health and well-being)<br>SDG4(Quality education)<br>SDG5(Gender equality)<br>SDG8(Decent work and economic growth) | | | | |

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1. Personality Development-I | Thinking- Meaning and Concept of thinking, Reasoning, Process of thinking. Critical Thinking- Meaning & concept of critical thinking, Features of critical thinking, Process of critical thinking. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 2. Personality Development-II | Creative thinking- Meaning & concept of creative thinking, Features of creative thinking, Process of creative thinking, levels of Creativity, Characteristics of creative person. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 3. Leadership Development-I | Leadership capsule. Important Leadership traits, Indicators of leadership and evaluation. | Whiteboard, PPT, Video Case Study, Project Based Activity, Application Based Activity | 5 |
| Unit 4. Leadership Development-II | Motivation- Meaning & concept, Types of motivation. Factors affecting motivation. Ethics and Honor codes. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 5. Social Service and Community Development | (i) Protection of Children & Women Safety. (ii) Road/Rail Safety. (iii) New Government Initiatives. (iv) Cyber and mobile Security Awareness. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |

## Part D(Marks Distribution)

| **Theory** | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 0 | 0 | 0 | 0 | 0 | 0 |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | R Gupta ; NCC National Cadet Corps A, B & C Certificate Examination Book; Ramesh Publishing House, 2018. |
| **Articles** | https://indiancc.mygov.in/activity/snehahoro/article-on-ncc-camp-and-training/ |
| **References Books** | Cadets training handbook common subjects (2017), D.G NCC Delhi-110030 |
| **MOOC Courses** | |
| **Videos** | https://www.youtube.com/watch?v=N7nNupMdS6c |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | COMPUTER SYSTEM ORGANIZATION |
| **Course Code** | BCA-301 |

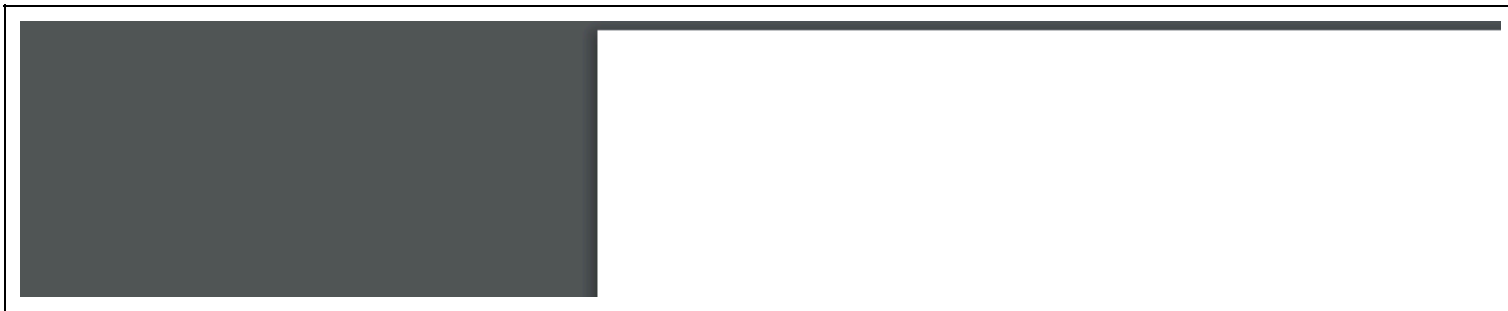
Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 2nd | **Semester** | 3rd | **Credits** | L | T | P | C |
| | | | | | 3 | 0 | 0 | 3 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Interdisciplinary Major | | | | | | | |
| **Pre-Requisite/s** | An Attendee of this course must be familiar with the following ❖ Digital Logic Gates ❖ Basic Computer Architecture ❖ Computer Number Systems | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Remembering : Basic computer architecture (Von Neumann Model) and functions of its various units**(BL1-Remember)**<br>**CO2-** Understanding: Understand the basic operations of digital computer system, its microoperations .**(BL2-Understand)**<br>**CO3-** Applying: Identify, compare and assess to Bus and memory, Register transfer logic and arithmetic operations, Summarize the types of micro operations.**(BL3-Apply)**<br>**CO4-** Analyzing: different types of addressing modes, various types of IO mapping techniques .**(BL4-Analyze)**<br>**CO5-** Evaluating: the performance issues of cache memory and virtual memory**(BL5-Evaluate)**<br>**CO6-** Create and design various hardware and software logics to make a computer system like ALU, Memory, Bus, etc.(Design)**(BL6-Create)** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| 1 | Register Transfer Language & micro-operations: Overview of Register Transfer Language & microoperations, Classification of Micro operations, Design of arithmetic, Logic and shift micro-operations. | Lecturing, Demontartions, Simulations | 8 |
| 2 | Architecture of a Processor: Von Newman architecture, Concept of ALU, Control Unit, Registers : Instruction Register, Control Word, Program Counter, Stack Organization, instruction set, instruction formats, addressing modes, instruction cycle, Interrupt and Interrupt cycle | Lecturing, Demontartions, Simulations | 8 |
| 3 | I/O Organization: Various I/O Devices, Data Transfer Mode: Program Controlled, Interrupt driven, DMA(Direct Memory Access). | Lecturing,Assignemnents | 8 |
| 4 | Memory organization-I: Definition, Memory Hierarchy System, Classification of memory: Primary Memory, Secondary Memory, Basic cells of RAM & ROM , Building large memories using chips. | Lecturing, PBL, Quiz | 8 |
| 5 | Memory organization-II: Concept of Associative memory, cache memory organization, virtualmemory organization | Lecturing, PBL | 8 |

Part C



## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | Hayes, J. P. (2017). Computer System Architecture. McGraw Hill.<br>Stallings, W. (2022). Computer Organization and Architecture. Prentice Hall. |
| **Articles** | |
| **References Books** | |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | - | - | - | - | - | - | - | - | - | - | - | 2 | - | 2 |
| CO2 | 1 | 2 | - | - | 2 | - | - | - | - | - | - | - | 2 | 3 | 3 |
| CO3 | 3 | 1 | - | - | 2 | - | - | - | - | - | - | - | 3 | 3 | 3 |
| CO4 | - | 1 | 1 | 2 | 1 | - | - | - | - | - | - | - | 2 | 2 | 3 |
| CO5 | - | 1 | - | - | 1 | - | - | - | - | - | - | - | 2 | 2 | 2 |
| CO6 | 3 | 1 | - | - | - | - | - | - | - | - | - | - | 2 | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Data Base Management System |
| **Course Code** | BCA-302(T) |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 2nd | **Semester** | 3rd | **Credits** | L | T | P | C |
| | | | | | 3 | 0 | 2 | 5 |
| **Course Type** | Embedded theory and lab | | | | | | | |
| **Course Category** | Disciplinary Major | | | | | | | |
| **Pre-Requisite/s** | Student should be aware of the functioning of Application software and how information technology helps in providing information by processing Data. | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Relational database management system, database modeling, normalization, transaction management, SQL queries and PLSQL operation**(BL1-Remember)**<br>**CO2-** Understand the need of DBMS and basic concepts of DBMS, various models and techniques of designing DBMS , Database languages (Knowledge, Understand)**(BL2-Understand)**<br>**CO3-** Apply: Apply the principles of designing DBMS and apply it to design data bases for real time applications. (Apply).**(BL3-Apply)**<br>**CO4-** Analyze: Analyze the quality of database using normalization techniques, conflict scenarios using concurrent processing techniques, analyze various transaction serialization scenario (Analyze)**(BL4-Analyze)**<br>**CO5-** Evaluating: Evaluation of the performance of a database created for deadlocks and concurrency control. (Investigate).**(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✓<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG1(No poverty)<br>SDG2(Zero hunger)<br>SDG4(Quality education)<br>SDG8(Decent work and economic growth) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| UNIT 1 | Introduction: Database system concepts, Traditional File Oriented Approach, Database management system, advantages and disadvantages of DBMS, Views of data, Three level Architecture of DBMS, Database languages: DDL, DML, data dictionary, Data base administrator, Database Users, Data Base Models: Relational, Hierarchical and Network Model their advantages and disadvantages.<br><br>**Database Security**: Threats, vulnerabilities,<br><br>and security measures in DBMS | Lectures with whiteboard/PPT, Recorded video/interactive videos. Quiz. | 10 |
| UNIT 2 | E-R Model: Basic Concepts, Design Issues, Entities & Entity set, Relationship & Relationship set, Attributes, Mapping Constraints, Keys, Entity-Relationship diagram (E-R diagram), Strong & weak entities, Generalization, Specialization, Aggregation, Reducing ER diagram to tables. | EXPERT LECTURE | 10 |
| UNIT 3 | UNIT-III Overall Structure of relational DBMS. Integrity rules: Entity integrity, Referential integrity rule. Keys in DBMS: primary key, Candidate key, alternate key. Functional Dependencies, Update anomalies. Normalization: First, Second, Third & BCNF Normal Forms.<br><br>**Denormalization:** Concepts and techniques<br><br>of denormalization, advantages and<br><br>disadvantages. | ROLE PLAY | 5 |
| UNIT 4 | UNIT- IV Relational Algebra: Selection, Projection, Different types of joins i.e. equi join, natural join, outer join, set operations. Definition of union, set difference, Cartesian product, intersection, Introduction to RDBMS, advantages and disadvantages of RDBMS. SQL: Background, Basic Structure, Data definition, Data manipulation statements, views, SET operations, Aggregate functions. | GROUP DISCUSSION | 10 |
| UNIT 5 | 5 UNIT-V Transaction concept, Transaction states, committed and uncommitted transactions, Implementations of Atomicity and durability, Serializability, Recoverability, Concurrency control in transaction.. | LECTURE | 10 |

| | | | |
|---|---|---|---|
| | **Distributed Transactions**: Concepts and techniques of distributed transactions, advantages and disadvantages. | | |

Part C

## F. List of Practical

| S.NO. | Practical List |
|---|---|
| 1. | Creating new tables or from existing tables under specific conditions with data types supported by general DBMS tools and Oracle. |
| 2. | Altering the structure of an existing table. |
| 3. | Adding constraints to table row wise and column wise along with adding constraints after table creation using ALTER + MODIFY |
| 4. | Inserting data with multiple options. |
| 5. | Updating and deleting specific record sets |
| 6. | Using Single, multiple row functions and special general functions. |
| 7. | Aggregating data using group functions. |
| 8. | Advance SQL queries and functions, Date Time functions |
| 9. | Creating user and roles with specific privileges, controlling user access by granting permission on specific data set. |
| 10. | Applying pattern matching using LIKE and regular expression to generate a report with specific requirements. |
| 11. | Creating Join and types of Join s |
| 12. | Creating Subqueries and evaluating performance of Joins and subquery for same problem set. |
| 13. | Creating Views and comparing it with tables, specific conditions for creating normal and complex view |
| 14. | Creating and applying synonyms and sequences. |
| 15. | PL/SQL: Declaring Variable as built in anchored and defined variable, record or row variable. |
| 16. | Writing Executable Statements using anonymous block code, control structure. |
| 17. | Implementing Types of Loops in PLSQL |
| 18. | Creating and understanding PLSQL code block structure. |
| 19. | Implementing SQL query in PLSQL block, using INTO clause and handling query returning more than one row. |
| 20. | Checking Scope rules on how variable life and scope are designed. |
| 21. | Accessing results of implicit Cursor using Cursor attributes. |

| | |
|---|---|
| 22. | Creating Explicit cursor and different types of it like Cursor For loop, param cursor. |
| 23. | Implementing predefine non predefine oracle provide Exception Handling in PLSQL code. |
| 24. | Implementing User defined and Raise application error procedure |
| 25. | Creating database triggers in PLSQL as row and statement triggers. |
| 26. | Creating instead of Cascading, mutating trigger. |
| 27. | Applying LOGON and LOGOFF trigger |
| 28. | Creating Procedure in PLSQL and executing it under different circumstances like SQL command prompt and calling it inside different block. |
| 29. | Creating Functions IN and OUT variables in PSQL. |
| 30. | Creating PSQL Packages using functions and procedure to achieve the specific objectives. |

Part D(Marks Distribution)

| **Theory** | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | Silberschatz, A., Korth, H. F., & Sudarshan, S. (2006, January 1). Database System Concepts. |
| **Articles** | |
| **References Books** | Elmasri, R., & Navathe, S. (1994, January 1). Fundamentals of Database Systems. Addison Wesley Publishing Company. |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | | | | 2 | | | | | 2 | | - | 1 | - | 1 |
| CO2 | 3 | 3 | 1 | 2 | 2 | - | - | - | - | 3 | - | - | 2 | - | 3 |
| CO3 | 2 | 2 | 1 | - | 2 | - | - | - | - | - | - | - | 3 | 2 | 3 |
| CO4 | 2 | 2 | - | 1 | 1 | - | - | - | - | - | - | - | 3 | 3 | 3 |
| CO5 | 1 | 2 | - | 1 | 1 | - | - | - | - | - | - | - | 3 | 3 | 3 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Java Programming |
| **Course Code** | BCA-303(T) |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 2nd | **Semester** | 3rd | **Credits** | L | T | P | C |
| | | | | | 3 | 0 | 2 | 5 |
| **Course Type** | Embedded theory and lab | | | | | | | |
| **Course Category** | Discipline Core | | | | | | | |
| **Pre-Requisite/s** | basic knowledge of any one programming language such as C/C++ | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** To remember various syntax rules of java programming **(BL1-Remember)**<br>**CO2-** To understand various Object-Oriented Concepts, Exception handling, Multithreading, networking and database connectivity techniques**(BL2-Understand)**<br>**CO3-** To implement java AWT and Swing and for GUI Programming and Event handling, java IO for Input and output handling, jdbc for database connectivity**(BL3-Apply)**<br>**CO4-** To analyze various Error ,and Database Handling techniques to learn how to improve the performance of the java application**(BL4-Analyze)**<br>**CO5-** To evaluate and compare various application Development techniques**(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✓<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG1(No poverty)<br>SDG2(Zero hunger)<br>SDG4(Quality education)<br>SDG8(Decent work and economic growth) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| 1 | Introduction of java Introduction to JAVA History of Java: Comparison of Java and C++; Java as an object oriented language: Java buzzwords; JVM and JRE;A simple program, its compilation and execution; the concept of path and class path: Java Basics: Data types; Operators- precedence and associatively; Type conversion; decision making controls – if, if ..else, switch; loops – for, while, do…while; advanced for loop. Special statements–return, break, continue, Modular programming: methods and method overloading, memory allocation and garbage collection, static keyword | Lectures with whiteboard/PPT, Recorded video/interactive videos | 15 |
| 2 | Object Oriented Programming in Java: Class fundamentals, java Packages, Access specifies, Constructors; Copy constructor; this pointer; finalize () method, array and String, mutable and immutable; String Buffer and String Builder; Java Inheritance: Inheritance basics, method overriding and final keyword, polymorphism, static and dynamic polymorphism Abstract Class & Interfaces: abstract classes, uses of abstract classes, implementation of abstract class, defining an interface, implementing & applying interfaces, extending interfaces | Lectures with whiteboard/PPT, Recorded video/interactive videos | 10 |
| 3 | Exception Handling; understanding Exception and its classes; class hierarchy for Throwable, call stack mechanism, checked and unchecked Exception. Try, catch and finally block, throw and throws claus Multithreading: Basic idea of a Thread, differences between process and Thread, multithreaded programming; different states of a Active thread, The lifecycle of a thread; Creating thread with the thread class and runnable interface, thread constructor and thread methods; Thread synchronization; Thread scheduling; Producer consumer relationship; Daemon thread, Selfish threads, interthread communication. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 9 |
| 4 | Java AWT: The class hierarchy of window fundamentals; The basic user interface components Label, Button, Check Box, Radio Button, menu and Choice menu, Text area, Frame; Layout managers Java Applets: Introduction of java Applet, Life cycle of applet; HTML Tags for applet. Java Event Handling Model: Java's event delegation model event source, Event listeners: ActionListener, MouseListener, KeyListener | Lectures with whiteboard/PPT, Recorded video/interactive videos | 7 |
| 5 | Collection Framework: Introduction to collections framework, collection interfaces, collection classes JAVA Database Connectivity (JDBC): JDBC Drivers, Connection Interface, Result set types of | Lectures with whiteboard/PPT, Recorded video/interactive videos | 4 |

| | | | |
|---|---|---|---|
| | Result Set, applying insert, delete, display and update operation | | |

## Part C

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | Naughton & Schildt The Complete Reference Java 2 Tata McGraw Hill |
| **Articles** | |
| **References Books** | Horstmann & Cornell “Core Java 2” (Vol I & II ) Sun Microsystems |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | 3 | 2 | - | - | - | - | - | - | - | - | - | 1 |
| CO2 | 2 | 2 | 1 | 1 | 2 | - | - | - | - | - | - | - | 3 | - | 3 |
| CO3 | 1 | 1 | 1 | - | 1 | - | - | - | - | - | - | - | 3 | 2 | 3 |
| CO4 | - | 2 | - | 2 | 1 | - | - | - | - | - | - | - | 3 | 3 | 3 |
| CO5 | - | 1 | - | - | 1 | - | - | - | - | - | - | - | 2 | 3 | 3 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Numerical Methods |
| **Course Code** | BCA-304 |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 2nd | **Semester** | 3rd | **Credits** | L | T | P | C |
| | | | | | 3 | 1 | 0 | 4 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Discipline Core | | | | | | | |
| **Pre-Requisite/s** | knowledge of simultaneous equations , matrix , calculus | | | **Co-Requisite/s** | knowledge of algebraic equation , differential ,integral | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** To remeber the various numerical techniques **(BL1-Remember)**<br>**CO2-** To understand different methods of interpolation as well as extrapolation**(BL2-Understand)**<br>**CO3-** To apply the various numerical techniques for solving real-life problems. **(BL3-Apply)**<br>**CO4-** To analyze The problems which cannot be solved by usual formulae and methods can be solved approximately by using numerical techniques. **(BL4-Analyze)** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| UNIT01 | Floating point representation of numbers, Arithmetic operation with Normalized Floating point of numbers, Zeros of Algebric and transcendental equations using Bisection, False position, Newton-Raphson and Secant method, Iteration Method. | Audio/Video clips, groupdiscussion, lecture with ppt, quiz, Classroom Presentation | 10 |
| UNIT02 | Solution of simultaneous linear equations, Gauss elimination method with pivoting, Gauss – Jordan method, Jacobi's iteration method and Gauss – Seidel iteration method, Crout's Method. | Audio/Video clips, groupdiscussion, lecture with ppt, quiz, Classroom Presentation | 8 |
| UNIT03 | Difference Operators and their relations, Newton's forward difference, backward difference and divided difference formulae, Lagrange's Interpolation formula and inverse interpolation | Audio/Video clips, groupdiscussion, lecture with ppt, quiz, Classroom Presentation | 8 |
| UNIT04 | Numerical Differentiation using Newton's forward difference, backward difference and divided difference interpolation. Newton Cote's integration Formula, Trapezoidal, Simpson's one -third, three -eight and Weddle's rules | Audio/Video clips, group discussion, lecture with ppt, classroom presentations | 8 |
| UNIT05 | Euler's Method, Modified Euler's method, Taylor's series method, Picard's method, Runge Kutta fourth order method, Predictor-corrector method | Audio/Video clips, group discussion, lecture with ppt | 8 |

Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | B.S.Grewal,Higher Engineering Mathematics ,Khanna Publishers<br>Khanna Publishers,Higher Engineering Mathematics ,Tata Mc Graw Hil |
| **Articles** | |
| **References Books** | M.K.Jain, S.R.K.Iyengar and R.K.Jain,Numerical Methods for Scientific and Engineering Computation,New Age International Publishers |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | - | 2 | - | - | - | - | 3 | - | - | - | - | - | - | - |
| CO2 | 2 | - | 2 | - | - | 1 | - | - | - | - | - | - | - | - | - |
| CO3 | 2 | - | 1 | - | - | - | 1 | - | - | - | - | - | - | - | - |
| CO4 | 1 | - | - | - | - | 3 | - | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Entrepreneurship Development |
| **Course Code** | BCA-305 |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 2nd | **Semester** | 3rd | **Credits** | L | T | P | C |
| | | | | | 3 | 0 | 0 | 3 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Interdisciplinary Major | | | | | | | |
| **Pre-Requisite/s** | Students should be familiar with the basic concepts of business. | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Students will recall the meaning, definition, and types of entrepreneurs. Students will be able to remember the functions and skills/traits required to be an entrepreneur. **(BL1-Remember)**<br>**CO2-** Students will be in a position to explain the relationship between entrepreneurs and economic development and will understand the process of creating a business plan and conducting a feasibility study. They can explain the relevance of location, environmental regulatory requirements, and pricing strategies for new businesses**(BL2-Understand)**<br>**CO3-** Students will be able to apply effective communication, leadership, marketing, and negotiation skills in entrepreneurial contexts. They will also apply time management skills to prioritize tasks and manage resources effectively. (BL3)**(BL3-Apply)**<br>**CO4-** Students will be able to conduct the cost benefit analysis. They will be able to assess different sources of finance for entrepreneurial ventures and the support provided by government programs, grants, and schemes for entrepreneurs. **(BL4-Analyze)**<br>**CO5-** Students will be able to evaluate the effectiveness of entrepreneurship development programs (EDPs) and assess the impact of government initiatives such as Make in India and Startup India on entrepreneurship. They will be able to evaluate the challenges faced by women entrepreneurs and propose strategies to overcome them.**(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✓<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG4(Quality education) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| 1 | Introduction to Entrepreneur & Entrepreneurship Meaning, Definition, types of entrepreneurs, functions, skills/traits required to be an entrepreneur, entrepreneurs and economic development, problems faced by entrepreneurs in India, Social Entrepreneurship. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 5 |
| 2 | Skills for Entrepreneurs Communication skills, creative thinking skills, leadership skills, marketing skills, negotiation skills, motivational skills, time management skills. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 8 |
| 3 | Starting a new business Form of business organizations, creating a business plan, feasibility study of business plan, registering a business, relevance of location, environmental regulatory requirements, pricing of products, cost benefit analysis. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 10 |
| 4 | Support to Entrepreneurs Concept of EDPs, Make in India, Startup India, Sources of Finance for Entrepreneurial Venture, Departments, Grants, Schemes & various policies and programs, Concept of MSMEs, Support to MSMEs in India. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 10 |
| 5 | Women Entrepreneurship- Concept of women entrepreneurs, role played by women entrepreneurs in economic development, Challenges in being a women entrepreneur, status of women entrepreneurs in India, Strategies to promote women entrepreneurship, Govt. initiatives to promote women entrepreneurship in India. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 8 |

Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | Khanka, S. S. (2006). Entrepreneurial Development. S. Chand Publishing. |
| **Articles** | |
| **References Books** | Mariotti, S., & Glackin, C. (2012). Entrepreneurship and Small Business Management. Pearson Higher Ed.<br><br>Hisrich, R., Shepherd, D., & Peters, M. (2016). Entrepreneurship. McGraw-Hill Education. |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | - | - | 2 | - | - | - | - | - | - | - | - | 1 | 2 | 3 |
| CO2 | - | - | - | - | - | 1 | - | - | 2 | - | - | - | 2 | 3 | 3 |
| CO3 | 1 | - | - | - | - | - | - | - | - | - | - | - | 1 | 3 | - |
| CO4 | - | - | 2 | - | - | - | - | - | - | - | - | - | 2 | - | - |
| CO5 | 1 | - | - | 2 | - | - | - | - | - | - | - | - | 2 | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Soft Skills |
| **Course Code** | BCA-306 |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 2nd | **Semester** | 3rd | **Credits** | L | T | P | C |
| | | | | | 2 | 0 | 0 | 2 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Skill Enhancement Courses | | | | | | | |
| **Pre-Requisite/s** | 1.Basic Language Proficiency 2.Educational Background 3.Motivation and Willingness to Learn Time Commitment 4.Technology Proficiency | | | **Co-Requisite/s** | 1.Communication Skills Workshop 2.Emotional Intelligence Training 3.Conflict Resolution Seminar 4.Leadership Development Program 5.Cross-Cultural Competency Training 6.Career Development Workshops | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Determine interpersonal skills and be an effective goal-oriented team player. **(BL1-Remember)**<br>**CO2-** Elaborate creativity and lateral thinking.**(BL2-Understand)**<br>**CO3-** Examine attitudes, emotional intelligence and understand its influence on behavior. **(BL3-Apply)**<br>**CO4-** Justify approaches to conflict resolution**(BL4-Analyze)**<br>**CO5-** Evaluate goal setting, management, decision-making skills.**(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG4(Quality education) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Module 1 | Self Analysis - SWOT Analysis, who am I,Attributes, Importance of Self Confidence,Self Esteem. Interpersonal Skills - Gratitude Understanding the relationship betweenLeadership Networking & Teamwork.Assessing Interpersonal Skills Situation description of Interpersonal SkillTeamwork:Necessity of Team Work Personally, Socially and Educationally | Classroom Lecture, PPts, | 10 |
| Module 2 | Creativity - Out of box thinking, Lateral Thinking.Leadership - Skills for a Good Leader, Assessment of Leadership Skills | Audio/Video clips, group discussion, lecture with ppt, Review AnalysisAudio Video Mode | 6 |
| Module 3 | Attitude- Factors influencing Attitude,Challenges, and lessons from Attitude,Etiquette. Emotional Intelligence What isEmotional Intelligence, emotional quotientwhy Emotional Intelligence matters, Emotion Scales. Managing Emotions. | Classroom Lecture, PPts, Videoes | 6 |
| Module 4 | Motivation - Factors of motivation, Self-talk,Intrinsic & Extrinsic Motivators. ConflictResolution - Conflicts in Human Relations –Reasons Case Studies, Approaches to conflict resolution. | Mind Map | 6 |
| Module 5 | Goal Setting - Wish List, SMART Goals,Blueprint for success, Short Term, Long Term, Lifetime Goals. Time Management Value of time, Diagnosing Time Management,Weekly Planner To-do list, Prioritizing work.Extempore Decision Making - Importance and necessity of Decision Making, Process and practical way of Decision Making,Weighing Positives & Negatives. Technical Topic Presentation. | Audio/Video clips, group discussion,lecture with ppt, quizLectures, Case Studies, Experiential Learning | 8 |

Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | Carnegie Dale, How to win Friends and Influence People, New York: Simon & Schuster, 1998. ThomasA Harris, I am ok, You are ok, New York-Harper and Row, 1972 |
| **Articles** | https://www.frontiersin.org/articles/10.3389/feduc.2019.00087/full https://www.cii.co.uk/media/6158020/a-useful-guide-to-swot-analysis.pdf http://www.mmmut.ac.in/News_content/35141tp news_10142020.pdf |
| **References Books** | Covey Sean, Seven Habit of Highly Effective Teens, New York, Fireside Publishers, 1998. Carnegie Dale, How to win Friends and Influence People, New York: Simon & Schuster, 1998. Thomas A Harris, I am ok, You are ok, New York-Harper and Row, 1972 Daniel Coleman, Emotional Intelligence, Bantam Book, 2006 |
| **MOOC Courses** | https://www.edx.org/learn/leadership/catalyst-leading-with-effective-communication-inclusive-leadership-training? hs_analytics_source=referrals&utm_source=mooc.org&utm_medium=referral&utm_campaign=mooc.org-course-list https://www.edx.org/learn/writing/university-of-california-berkeley-academic-and-business-writing? hs_analytics_source=referrals&utm_source=mooc.org&utm_medium=referral&utm_campaign=mooc.org-course-list |
| **Videos** | https://www.youtube.com/watch?v=fq98P9N9Hbg https://www.youtube.com/watch?v=uA5YeqgsjmYhttps://www.youtube.com/watch?v=eBSeCp__xhI |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | - | - | 3 | - | - | - | 2 | - | 3 | - | - | 3 | 2 | - |
| CO2 | 2 | 3 | - | - | - | - | - | 2 | - | - | - | - | - | 3 | - |
| CO3 | - | - | - | - | - | 1 | - | - | - | - | - | - | 2 | - | - |
| CO4 | - | 2 | - | 2 | - | - | - | 3 | - | - | - | - | - | 3 | - |
| CO5 | 3 | - | 3 | 3 | - | 3 | - | - | - | 3 | - | - | 3 | - | 2 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Indian Constitution |
| **Course Code** | BCA-307 |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 2nd | **Semester** | 3rd | **Credits** | L | T | P | C |
| | | | | | 2 | 0 | 0 | 2 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Disciplinary Major | | | | | | | |
| **Pre-Requisite/s** | | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** To familiarize the students with the key elements of the Indian constitution.**(BL4-Analyze)**<br>**CO2-** To enable students to grasp the constitutional provisions and values.**(BL1-Remember)**<br>**CO3-** To acquaint the students with the powers and functions of various constitutional offices and institutions.**(BL3-Apply)**<br>**CO4-** To make students understand the basic premises of Indian politics and role of constitution and citizen-oriented measures in a democracy.**(BL2-Understand)** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✓<br>Environment ✕ | | **SDG (Goals)** | | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit-1 | Introduction: Indian Constitution: Making and basic premise  Meaning and Significance of Constitution.  Preamble and Salient features of the Indian Constitution.  Sources of Indian constitution.  Fundamental Rights, Fundamental Duties. Directive Principles | Lecturing | 6 |
| unit-2 | UNIT – II Union and State Government  President of India- Election, Powers and functions  Prime Minister and Cabinet – Structure and functions  Governor- Powers and functions  Chief Minister and Council of Ministers – Functions. | Audio/Video clips, group discussion, lecture with PPTs, Quiz | 6 |
| Unit-3 | UNIT – III Legislature and Judiciary  Parliament – Lok Sabha and Rajya Sabha – Composition and powers  State Legislative Assembly and Legislative Council – Composition and powers  Judicial System in India – Structure and features  Supreme Court and High Court: Composition, Jurisdiction. | Case Study | 6 |
| Unit-4 | UNIT – IV Governance and Constitution  Federalism in India – Features  Local Government -Panchayats –Powers and functions; 73rd and 74th amendments  Election Commission – Composition, Powers and Functions; Electoral Reforms  Citizen oriented measures – RTI and PIL – Provisions and significance | Case Study | 6 |
| Unit 5 | UNIT – V Miscellaneous  Emergency Provision  Amendment of Constitution  Special Provisions regarding some states  Center-State Relationship  Writs | Case Study | 6 |

Part C

| Modules | Title | Indicative-ABCA/PBL/ Experiments/Field work/ Internships | Bloom's Level | Hours |
|---|---|---|---|---|
| 2-5 | group discussion | Case Study | BL4-Analyze | 10 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | Kumar, R. (2022). Universal's Guide to the Constitution of India. Universal Law Publishing. http://books.google.ie/books?id=an78gq3JwzYC&printsec=frontcover&dq=INDIAN+CONSTITUTION&hl=&cd=1&source=gbs_api |
| **Articles** | |
| **References Books** | Israel, M., & Austin, G. (1967). The Indian Constitution: Cornerstone of a Nation. International Journal, 22(4), 696. https://doi.org/10.2307/40200234 |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - | 2 | 2 |
| CO2 | - | 1 | - | 3 | - | - | - | - | - | - | - | 1 | - | - | - |
| CO3 | - | - | - | 2 | - | - | - | 1 | - | - | - | - | 1 | - | - |
| CO4 | - | - | - | - | 4 | - | - | - | 2 | - | - | 2 | - | 3 | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | NCC |
| **Course Code** | NCC-0303(T) |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 2nd | **Semester** | 3rd | **Credits** | L | T | P | C |
| | | | | | 2 | 0 | 2 | 4 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Generic Elective | | | | | | | |
| **Pre-Requisite/s** | Should be acquainted with the basics knowledge of General Awareness about Leadership Quality, Personality Development, Defense system etc | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Define thinking, reasoning, critical thinking and creative thinking.**()**<br>**CO2-** To think critically about different life related issues.**()**<br>**CO3-** Think divergently and will try to break functional fixedness.**()**<br>**CO4-** Creatively in their real-life problems**()**<br>**CO5-** Understand the organizations related to disaster management and Their functioning.**()**<br>**CO6-** Appreciate the role of NCC cadets in disaster management.**()** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✓<br>Environment ✕ | | **SDG (Goals)** | SDG4(Quality education)<br>SDG6(Clean water and sanitation)<br>SDG13(Climate action)<br>SDG15(Life on land) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1. Personality Development | (i) Group Discussions - Change your Mindset (ii) Public Speaking. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 2. Leadership Development | Case Studies – APJ Abdul Kalam, Deepa Malik, Maharana Pratap, N Narayan Murthy. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 3. Disaster management | (i) Disaster Management Capsule. (ii) Organisation. (iii) Types of Disasters. (iv) Essential Services. (v) Assistance. (vi) Civil Defence Organisation. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 4. Border & Coastal Areas | History, Geography & Topography of Border/ Coastal Areas. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 5. Adventure | Adventure activities. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |

Part D(Marks Distribution)

| **Theory** | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | R Gupta ; NCC National Cadet Corps A, B & C Certificate Examination Book; Ramesh Publishing House, 2018. |
| **Articles** | |
| **References Books** | Singh, Neeraj; A Hand Book of NCC; Kanti Prakashan Publisher |
| **MOOC Courses** | |
| **Videos** | https://www.youtube.com/watch?v=kvdDHFALpTw |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Software Engineering |
| **Course Code** | BCA 402 |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 2nd | **Semester** | 4th | **Credits** | L | T | P | C |
| | | | | | 3 | 0 | 0 | 3 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Disciplinary Major | | | | | | | |
| **Pre-Requisite/s** | student must have knowledge about basic data structures , computer organization & programming language concepts. | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** To remember the basics of software engineering**(BL1-Remember)**<br>**CO2-** To understand the basics characteristic's & crisis of software and process of software engineering systems**(BL2-Understand)**<br>**CO3-** To implement various SDLC, ER, DFD models, to collect SRS, And understand the software.**(BL3-Apply)**<br>**CO4-** To Analyze various various testing techniques and the concept of testing strategies**(BL4-Analyze)**<br>**CO5-** To evaluate the the need of Software Maintenance and Software Project Management Software **(BL5-Evaluate)**<br>**CO6-** To create the various Design Strategies, Architectural Design concept for better development of software.**(BL6-Create)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✓<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG1(No poverty)<br>SDG2(Zero hunger)<br>SDG4(Quality education) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit-1 | Introduction to Software Engineering: Software, The changing nature of software, product and process, software engineering-a layered technology. | Lecturing | 6 |
| Unit-2 | Process Models: Software Development Process Model, Waterfall Model, Prototyping Model, Spiral Model, Iterative Model | Case Study | 6 |
| Unit-3 | Software Project Management: The Management Spectrum, Scheduling and Tracking, SW Measurement - Size, Process and Project Metrics; LOC | Lecturing | 6 |
| Unit-4 | Software Design: Design Concepts-abstraction, architecture, modularity . Software Quality Assurance: Quality Concepts, Software Quality Assurance, Assurance, Software Reliability, Introduction to ISO standard. | Case Study | 6 |
| Unit-5 | Software Testing and maintenance: Definition, Types of Testing: Black Box Testing, White Box Testing, Unit Testing, Integration Testing, system testing , Introduction of maintenance. | Case Study | 6 |

Part C

**Case Study**
**Software Engineering (402)**

1. Analysing the challenges and solutions for software maintenance: Students are required to identify the challenges appeared during software maintenance using various types of information gathering tools and must propose a systematic and feasible maintenance plan with output showing growth with respect to following points
    - User Satisfaction level
    - Software periodic update
    - Software Licence renewable
    - Software upgradability.

2. Perform automated testing and design customized test cases on any project modules. Also report the bugs encountered during testing phase and compute time incurred in rectifying bugs during testing phase. Compare the time involved in rectifying bugs at development phase and at testing phase.
3. You are required to build a Inventory management system for a departmental store, Prepare a logical design as well as use case and system flowcharts for the same.

4. You are required to build a Student information system for a departmental of school of Engineering, Prepare a logical design as well as use case and system flowcharts for the same.
5. 
6. Compute the following using any project/modules of your choice
    - Product Metrics
    - Process Metrics
    - Project Metrics
7. Prepare a complete SRS report of a software that is not in existence as well as software that is already is being used but needs to be updated.

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | Pressman, R. S., & Dr, B. R. M. (2014, January 23). Software Engineering: A Practitioner's Approach. McGraw-Hill Education. http://books.google.ie/books? |
| **Articles** | |
| **References Books** | Pressman, R. S., & Dr, B. R. M. (2014, January 23). Software Engineering: A Practitioner's Approach. McGraw-Hill Education. http://books.google.ie/books? |
| **MOOC Courses** | |
| **Videos** | https://onlinecourses.nptel.ac.in/noc20_cs68/preview |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | 1 | - | - | - | - | - | - | - | 1 | - | 2 |
| CO2 | 1 | - | - | - | 1 | 2 | - | - | - | - | - | - | 1 | 2 | 3 |
| CO3 | 2 | 1 | - | - | 1 | - | - | - | - | - | - | - | 3 | 2 | 3 |
| CO4 | 2 | 2 | - | 3 | 1 | - | - | - | - | - | - | - | 3 | 2 | 3 |
| CO5 | 2 | 2 | - | 2 | 1 | - | - | - | - | - | - | - | 3 | 2 | 3 |
| CO6 | 1 | 1 | 2 | 3 | 2 | 2 | - | - | - | 2 | - | - | 3 | 3 | 3 |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Web Designing with PHP |
| **Course Code** | BCA-401(P) |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 2nd | **Semester** | 4th | **Credits** | L | T | P | C |
| | | | | | 0 | 0 | 3 | 3 |
| **Course Type** | Lab only | | | | | | | |
| **Course Category** | Disciplinary Major | | | | | | | |
| **Pre-Requisite/s** | | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** To remember various Web Development Strategies using PHP and syntax rules of web Programming**(BL1-Remember)**<br>**CO2-** To understand the basics of web architecture, Development techniques, knowledge about file system.**(BL2-Understand)**<br>**CO3-** To implement: HTML, JavaScript and Arry, strings, database connectivity to create Web applications.**(BL3-Apply)**<br>**CO4-** To analyze various Server-side programming techniques and OOPS Techniques**(BL4-Analyze)**<br>**CO5-** To evaluate and improve the performance of the web application with the help of session handling Techniques**(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✓<br>Employability ✓<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG1(No poverty)<br>SDG2(Zero hunger)<br>SDG3(Good health and well-being)<br>SDG4(Quality education)<br>SDG5(Gender equality)<br>SDG8(Decent work and economic growth) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| 1 | Introducing PHP – history and Basic development Concepts, PHP delimiters, creating user-defined variables, data types with PHP, type casting – Creating first PHP Scripts, declaring and using constants, Using Variable and Operators, – Storing Data in variables -Setting and Checking variables Data types, comments with php, useful readymade function of PHP. Controlling Program Flow: making decisions with if, else, and switchwriting More Complex Conditional Statements – Repeating Action with Loops and super global variables. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 8 |
| 2 | Use of HTML for web design and JavaScript-, html scripts and form elements, embedding php with HTML, redirecting web pages, adding dynamic content using Java script, Working with Numeric Functions. Working with Arrays: Storing Data in Arrays –Numerically index array, associative and multi-decisional, array Processing Arrays with Loops and Iterations – Using Arrays with Forms - Working with Array Functions, Array sorting, converting array to scalar variables – Working with Dates and Times | Lectures with whiteboard/PPT, Recorded video/interactive videos | 8 |
| 3 | String Handling: formatting strings, joining and splitting a string comparing strings matching and replacing substrings, string functions, introduction of php regular expression. Exception Handling: exception handling structure, try…catch…throw Introduction to file system- file system and uses, saving program data for later use for file system, opening a file, creating and writing to a file closing a file and deletion operation on file, reading data from a file, file handling functions. Processing Directories. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 8 |
| 4 | Using PHP Functions and Classes: Introduction to functions. Creating userdefined function parameters, returning values, calling by values versus calling by reference, using include () and require () functions. Creating PHP Classes – Using Advanced OOP Concept, creating a PHP class, object, methods, operations, class attributes, class method invocation, php static hinting, object cloning, inheritance, final keyword, php abstract class, and interface. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 8 |
| 5 | Working with Database: working on MYSQL database, connection PHP with MySQL, creating database tables, implementing insert delete, update and select query using PHP script, | Lectures with whiteboard/PPT, Recorded video/interactive videos | 8 |

Part C

# PBL TOPICS

## PHP

1. **Simple CMS (Content Management System):**
- Build a basic CMS using PHP where users can create, edit, delete, and manage content (e.g., articles, blog posts).
- Include features like user authentication, role-based access control, and a WYSIWYG editor for content creation.

2. **Online Quiz System:**
- Develop an online quiz application where users can take quizzes on various topics.
- Implement features such as user registration, quiz creation, multiple-choice questions, scoring, and result display.

3. **Online Task Management System:**
- Create a task management application where users can create tasks, assign them to others, set deadlines, and track progress.
- Include features like user authentication, task categorization, priority levels, and status updates.

4. **E-commerce Website:**
- Build a simple e-commerce platform using PHP where users can browse products, add them to cart, and make purchases.
- Implement features like user registration, product catalog, shopping cart functionality, and payment integration (e.g., PayPal).

5. **OnlineStudent Information System:**
- Develop a student information system for managing student records, course details, grades, and attendance.
- Include features such as user authentication, student enrolment, course registration, and grade management.

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | VIKRAM VASWANI PHP A Beginner’s Guide Tata McGraw-Hill |
| **Articles** | Steven Holzner The PHP Complete Reference – Tata McGraw-Hil |
| **References Books** | |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 3 | 3 | 1 | 2 | - | - | - | - | - | - | - | 1 | 2 | 1 |
| CO2 | 2 | 2 | 3 | 2 | 1 | - | - | - | - | - | - | - | 2 | 2 | 2 |
| CO3 | 2 | 1 | 1 | 1 | 3 | - | - | - | - | - | - | - | 1 | 2 | 1 |
| CO4 | 1 | 2 | 1 | 2 | 2 | - | - | - | - | - | - | - | 2 | 2 | 1 |
| CO5 | 2 | 2 | 2 | 1 | 2 | - | - | - | - | - | - | - | 1 | 2 | 1 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Python Programming |
| **Course Code** | BCA-403(T) |

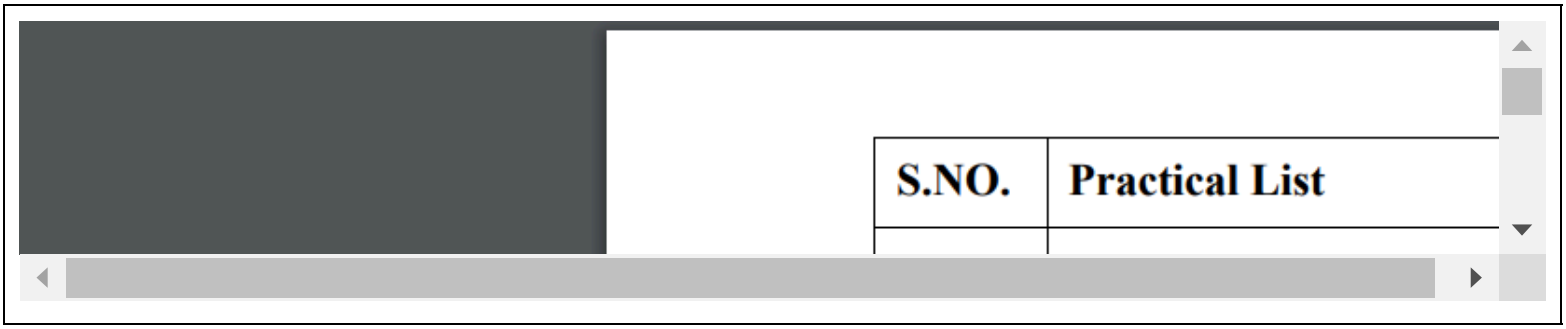
Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 2nd | **Semester** | 4th | **Credits** | L | T | P | C |
| | | | | | 2 | 0 | 2 | 4 |
| **Course Type** | Embedded theory and lab | | | | | | | |
| **Course Category** | Disciplinary Major | | | | | | | |
| **Pre-Requisite/s** | | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** To remember the basic programming concept. **(BL1-Remember)**<br>**CO2-** Understand the basics of Python like python origin downloading and installing and basic concepts of python.**(BL2-Understand)**<br>**CO3-** Apply the various conditional and looping statement and functional programming. **(BL3-Apply)**<br>**CO4-** Explain various objects numbers and sequence in python Analyze the concept of regular expression**(BL4-Analyze)**<br>**CO5-** Evaluate the concept of object-oriented programming for better utilization of language**(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✓<br>Employability ✓<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG1(No poverty)<br>SDG2(Zero hunger)<br>SDG4(Quality education) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1 | Introduction to Python programming Introduction, origin of Python, Downloading, Installing and Running Python, Python Basics: Comment, Identifier, Indentations, Basic data types, conversions, operators, Build in functions. I/O Statements, Condition Statements & Loops: If, else, elif), conditional expressions, while, for, break continue | Lectures | 6 |
| Unit 2 | Data Structures in Python Lists: Introduction, Accessing list, Operations, Working with lists, Tuple: Introduction, Accessing tuples, Operations, Working with list, Dictionaries: Introduction, Accessing values in dictionaries, Working with dictionaries, Set: Introduction ,Accessing set, Operations, Working with sets | Lectures | 6 |
| Unit 3 | Functions, Modules, File Handling Functions: Defining a function, Calling a function, Types of functions, Function Arguments, Anonymous function, Global and local variables, Recursion. Modules: Creating modules, Importing module, Packages, File Handling :Opening and closing files, Reading and writing files | Experiments | 6 |
| Unit 4 | Exceptional Handling, Regular Expressions Exception Handling: Exception, Exception Handling, Try and Except clause,User Defined Exceptions, Exception handling in files). Regular Expressions: Introduction/motivation, special symbols and characters for REs , Match function, Search function., Matching VS Searching., Modifiers, Patterns. | Experiments | 6 |
| Unit -5 | Object Oriented Programming in Python Introduction, OOPS Basics: Class and object Constructors, Need of Encapsulations, Attributes, default attributes, static attributes, static methods, initializing objects, Pass by reference, self. Relational-ships: Introduction, Aggregation, Dependency. Inheritance: Need of Inheritance, Overriding, Super, Types of Inheritance. Abstract Class, methods. | PBL | 6 |

## Part C



| S.NO. | Practical List |
|---|---|
| | |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | Gondaliya, V. (2019, August 30). Programming With Python. Vaibhav Gondaliya. |
| **Articles** | |
| **References Books** | Hetland, M. L. (2006, November 7). Beginning Python. Apress |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 1 | - | - | 2 | 2 | - | - | - | - | 1 | - | 1 | - | 1 |
| CO2 | 1 | 1 | - | 2 | 2 | 2 | - | - | - | 2 | - | - | 1 | 2 | 3 |
| CO3 | - | 2 | - | - | - | - | - | - | - | - | - | - | 3 | 2 | 3 |
| CO4 | - | 2 | - | 2 | 1 | - | - | - | - | - | - | - | 3 | 2 | 3 |
| CO5 | - | 2 | - | 2 | 1 | - | - | - | - | - | - | - | 3 | 2 | 3 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Computer Oriented Statistical Methods |
| **Course Code** | BCA-404 |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 2nd | **Semester** | 4th | **Credits** | L | T | P | C |
| | | | | | 3 | 1 | 0 | 4 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Disciplinary Minor | | | | | | | |
| **Pre-Requisite/s** | knowledge of statistics and basic calculation | | | **Co-Requisite/s** | knowledge of basic of statistics and arith matic calculation | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** To remember design data collection plans and basic tools of descriptive statistics **(BL1-Remember)**<br>**CO2-** To Understand the concept of sampling distribution of a statistic and its properties, difference between parameter and statistic **(BL2-Understand)**<br>**CO3-** TO apply the properties of unbiasedness and null hypothesis, alternative hypothesis and test statistic **(BL3-Apply)**<br>**CO4-** To analyze the relationship between two variables using scatter plot and Interpret a simple correlation**(BL4-Analyze)** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG4(Quality education) | | | | |

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| UNIT01 | Frequency distribution and Frequency charts, Histogram, Frequency polygons, Frequency curves and Cumulative frequency distribution | Audio/Video clips, group discussion, lecture with ppt, quiz | 6 |
| UNIT02 | Moments, Skewness and kurtosis, Range, mean deviation, standard deviation, coefficient of variation. | Audio/Video clips, group discussion, lecture with ppt, quiz | 8 |
| UNIT03 | Permutation and Combination, Repetition and Constrained Repetition, Binomial Coefficients, Binomial Theorem. : Sample space, events, classical definition of probability, theorems on total and compound probability, independent and dependent events, mutually exclusive events | Audio/Video clips, group discussion, lecture with ppt, classroom presentations | 10 |
| UNIT04 | Coefficient of correlation, rank Correlation, Regression analysis, Curve fitting: Method of Least square. | Audio/Video clips, group discussion, lecture with ppt, classroom presentations | 8 |
| UNIT05 | Simple and composite hypothesis, errors of kind-I and kind-II, critical region, level of significance. Tests for simple hypotheses, Student's t test, F-test and applications. | Audio/Video clips, group discussion, lecture with ppt | |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | Gupta, S. P. (2023). Introductory Business Statistics. Sultan Chand & Sons.<br>Ray, M., Sharma, H., & Singh, U. (n.d.). STATISTICAL METHODS. Ram Prasad Publications(R.P.H.). |
| **Articles** | |
| **References Books** | Spiegel, M., & Stephens, L. (2007). Schaum's Outline of Statistics. McGraw Hill Professional. |
| **MOOC Courses** | |
| **Videos** | |

Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | 2 | - | 2 | - | - | 1 | - | - | - | - | - | - | - | - |
| CO2 | 2 | - | 1 | - | - | 3 | - | - | - | - | - | - | - | - | - |
| CO3 | 2 | - | - | - | 1 | - | - | 3 | - | - | - | - | - | - | - |
| CO4 | 2 | - | - | 1 | - | - | - | - | - | - | 2 | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Minor Project |
| **Course Code** | BCA-405 |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 2nd | **Semester** | 4th | **Credits** | L | T | P | C |
| | | | | | 0 | 0 | 2 | 2 |
| **Course Type** | Project | | | | | | | |
| **Course Category** | Projects and Internship | | | | | | | |
| **Pre-Requisite/s** | sofetware development life cycle, Project life cycle | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Understand the project Develpoment Life Cycle **(BL2-Understand)**<br>**CO2-** Apply the core discipline knowledge and develop a complete system for the given / chosen task**(BL3-Apply)**<br>**CO3-** Analize the performance of the system develpoed using standard techniques for testing **(BL4-Analyze)**<br>**CO4-** Evaluate the performacne of the system develpoed against the performance of similar tools./ systems **(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✓<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| UNIT01 | Frequency distribution and Frequency charts, Histogram, Frequency polygons, Frequency curves and Cumulative frequency distribution | Audio/Video clips, group discussion, lecture with ppt, quiz | 6 |

## Part C

| Modules | Title | Indicative-ABCA/PBL/ Experiments/Field work/ Internships | Bloom's Level | Hours |
|---|---|---|---|---|
| 1 | Develop Synopsis for the proposed / chosen topic | PBL | BL2-Understand | 10 |
| 2 | Develop prototype of the ysstem proposed | PBL | BL3-Apply | 30 |
| 3 | Performa testing on the modules and the ysstme as a whole | Experiments | BL4-Analyze | 10 |
| 4 | incoporate the changes required based on testing result | PBL | BL3-Apply | 10 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | |
| **Articles** | |
| **References Books** | |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | 2 | - | - | 2 | - | - | 1 | - | - | 2 | 1 | 2 |
| CO2 | - | - | - | 2 | - | - | 2 | - | - | 2 | - | - | 1 | 2 | 1 |
| CO3 | - | - | - | - | - | - | 1 | - | - | - | - | - | 2 | 2 | 1 |
| CO4 | - | - | - | 1 | - | - | - | - | - | 2 | - | - | 1 | 1 | 3 |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Mathematical Reasoning and Aptitude |
| **Course Code** | BCA-406 |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 2nd | **Semester** | 4th | **Credits** | L | T | P | C |
| | | | | | 2 | 0 | 0 | 2 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Disciplinary Major | | | | | | | |
| **Pre-Requisite/s** | Basic knowledge of mathematical operations. | | | **Co-Requisite/s** | Basic knowledge of number system. | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** To get insight the basic concepts of quantitative ability and logical reasoning Skills. **(BL1-Remember)**<br>**CO2-** To understand various techniques to solve real life problems through concepts of logical reasoning.**(BL2-Understand)**<br>**CO3-** To apply reasoning tools for solving various problems like; distance height, calendar, clock, time, work, age and permutation.**(BL3-Apply)**<br>**CO4-** To analyze and solve campus placements aptitude papers covering Quantitative Ability and Logical Reasoning Ability.**(BL4-Analyze)**<br>**CO5-** To evaluate many short tricks for helping to compete in various competitive exams like CAT, CMAT, GATE, GRE, GATE, UPSC, GPSC etc.**(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✓<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG4(Quality education) | | | | |

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1 | Problems on Trains, Height and Distance, Calendar, Average, Numbers, Problems on H.C.F and L.C.M, Simplification. | Audio/Video clips, group discussion, lecture with PPTs, quiz | 4 |
| Unit 2 | Surds and Indices, Chain Rule, Boats and Streams, Time and Distance, Time and Work, Problems on Ages. | Audio/Video clips, group discussion, lecture with PPTs, Quiz | 4 |
| Unit 3 | Permutation and Combination, Problems on Numbers, Decimal Fraction, Square Root and Cube Root, Ratio and Proportion. □ Data Interpretation: Table Charts, Pie Charts, Bar Charts, Line Charts. | Audio/Video clips, group discussion, lecture with PPTs, Quiz | 4 |
| Unit 4 | Verbal Reasoning: Logical Sequence of Words, Syllogism, Cause and Effect, Venn Diagrams, Analogy, Character Puzzles, Classification, Arithmetic Reasoning, Blood Relation Test, Series Completion, Dice, Cube and Cuboids, □ □ Seating Arrangement, Direction Sense Test, Data Sufficiency, Verification of Truth | Audio/Video clips, group discussion, lecture with PPTs, Quiz | 4 |
| Unit 5 | Puzzles: Sudoku, Number puzzles, Missing letters puzzles, Logical puzzles, Clock puzzles. | Audio/Video clips, group discussion, lecture with PPTs, Quiz | 4 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | Dr. R. S. Agarwal, Quantitative Aptitude, S. Chand Publication |
| **Articles** | |
| **References Books** | Abhijit Guha, Quantitative Aptitude for Competitive Examinations, McGraw Hill Publications |
| **MOOC Courses** | |
| **Videos** | |

Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | - | - | - | 2 | 2 | - | 1 | - | - | - | - | 1 | - | 1 |
| CO2 | - | 3 | - | - | 3 | - | - | 1 | - | - | - | - | 1 | - | 3 |
| CO3 | 3 | - | - | 1 | - | - | - | - | - | - | - | - | 3 | - | 3 |
| CO4 | 3 | - | - | 2 | 1 | - | - | - | - | - | - | - | 2 | - | 3 |
| CO5 | 2 | 2 | - | 1 | - | - | - | - | - | - | - | - | 2 | 2 | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Universal Human Values |
| **Course Code** | BCA-407 |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 2nd | **Semester** | 4th | **Credits** | L | T | P | C |
| | | | | | 2 | 0 | 0 | 2 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Ability Enhancement Courses | | | | | | | |
| **Pre-Requisite/s** | | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** To help the students appreciate the essential complimentarily between “VALUES” and “SKILLS” to ensure sustained happiness and prosperity which are the core aspirations of all human beings.**(BL2-Understand)**<br>**CO2-** To facilitate the development of a holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the human reality and the rest of existence. **(BL2-Understand)**<br>**CO3-** To highlight plausible implications of such a holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behavior and enriching interactions with nature. **(BL3-Apply)**<br>**CO4-** To provide a much-needed orientation input in value education to the young enquiring minds.**(BL4-Analyze)** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✓<br>Human Values ✓<br>Environment ✕ | | **SDG (Goals)** | SDG1(No poverty)<br>SDG3(Good health and well-being)<br>SDG4(Quality education)<br>SDG5(Gender equality)<br>SDG10(Reduced inequalities) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| I | Introduction to Value Education • Value education: Concept, Need and Process • Self-Exploration- what is it? – its content and process • The basic human aspirations- continuous happiness and prosperity • Method to fulfill the basic human aspiration • Right understanding, Relationship and Physical facility | Whiteboard, PPT, Video | 6 |
| II | Understanding Harmony in the Human Being- Harmony in Myself • Understanding human being as a co-existence of sentient 'I' and material 'Body' • Understanding the needs of ('I') and 'Body' – 'Sukh' and 'Suvidha' • Understanding body as an instrument of 'I' ('I' being the seer, doer and enjoyer) • Understanding the Harmony of 'I' with the Body- 'Sanyam' and 'Swasthya';correct appraisal of physical needs, meaning of prosperity in detail. • Program to ensure Sanyam and Swasthya. | Whiteboard, PPT, Programming Labs | 6 |
| III | Understanding the Harmony in Family and Society- harmony in Human-Human Relationship • Family as basic unit of human interactions and values in Relationships. • Understanding the harmony in Society (society being extension of family): Resolution, Prosperity, fearlessness(trust) and co-existence as comprehensive Human Goals. • Vision of the Universal Human Order • Understanding the meaning of Trust; difference between Intention and Competence. • Understanding the meaning of Respect, difference between Respect and Differentiation; the other salient values in relationship. | Whiteboard, PPT, Programming Labs | 6 |
| IV | Understanding the Harmony in the Nature and Existence – Whole Existence as Coexistence • Understanding the harmony in Nature • Interconnectedness and mutual fulfilment among the four orders of nature recyclability and self-regulation in Nature • Understanding Existence as Co-existence of mutually interacting units in all-pervasive space • Holistic perception of harmony at all levels of existence | Whiteboard, PPT, Programming Labs | 6 |
| V | Professional Ethics • Definitiveness of Ethical Human Conduct • Providing the basis for Universal Human Values and ethical Human conduct • Professional ethics in the light of right Understanding • Competence in Professional ethics • Strategies for transition towards Value-based life and profession. | Whiteboard, PPT, Programming Labs | 6 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | Naagarazan, R. S. (2020). A Textbook on Professional Ethics and Human Values (1st ed.). New Age International Private Limited.<br>Gaur, R. R., Asthana, R., & Bagaria, G. P. (2019). A Foundation in Human Values and Professional Ethics (2nd ed.). Excel Books. |
| **Articles** | |
| **References Books** | Mazumdar, Prof. (2013). Values and Ethics in Profession (3rd ed.). Everest Publishing House.<br>Tripathi, A. N. (2004). Human Values. New Age International Publishers. |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | - | - | - | - | - | - | - | 2 | - | - | 1 | 1 | 1 | 2 |
| CO2 | - | 2 | - | - | - | - | - | - | - | - | 2 | 2 | 1 | 2 | - |
| CO3 | 1 | - | - | - | - | - | - | - | 2 | - | - | 1 | - | 1 | 1 |
| CO4 | - | 2 | - | - | - | - | - | - | - | - | 2 | 2 | 1 | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | NCC |
| **Course Code** | NCC-0404 (T) |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 2nd | **Semester** | 4th | **Credits** | L | T | P | C |
| | | | | | 2 | 0 | 2 | 4 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Generic Elective | | | | | | | |
| **Pre-Requisite/s** | Should be acquainted with the basics knowledge of General Awareness about Leadership Quality, Personality Development, Defense system etc | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Develop the qualities of social skills.**()**<br>**CO2-** Imbibe leadership qualities. **()**<br>**CO3-** Be motivated to serve the nation by joining Armed forces. **()**<br>**CO4-** Contribute in environmental awareness and conservation activities**()**<br>**CO5-** Keep abreast of current affairs & general awareness.**()**<br>**CO6-** Effectively contribute in managing disaster relief tasks**()** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✓<br>Environment ✕ | | **SDG (Goals)** | SDG3(Good health and well-being)<br>SDG4(Quality education)<br>SDG6(Clean water and sanitation)<br>SDG13(Climate action)<br>SDG15(Life on land) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1. Personality Development | Group Discussions – Social Skills & Time management. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 2. Leadership Development | Case Studies – Case Studies – Ratan Tata, Rabindra Nath Tagore, Role of NCC cadets in 1965 war. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 3. Disaster management | (i) Initiative Trg, Organising Skills. (ii) Dos and Don'ts. (iii) Natural Disasters. (iv) Man Made Disasters. (v) Fire Services and Fire Fighting. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit-4.Environmental Awareness | Adventure Environmental Awareness and Conservation, Local and global approaches to conserve nature. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 5. General Awareness & Armed Forces | General Awareness, Army, Navy, Air Force and Central Armed Police Forces. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |

Part D(Marks Distribution)

| **Theory** | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | R Gupta ; NCC National Cadet Corps A, B & C Certificate Examination Book; Ramesh Publishing House, 2018. |
| **Articles** | https://indiancc.mygov.in/ |
| **References Books** | Singh, Neeraj; A Hand Book of NCC; Kanti Prakashan Publisher Cadet training hand book specialised subjects (2017) |
| **MOOC Courses** | |
| **Videos** | https://www.youtube.com/watch?v=eBA5t4iepAA |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | NCC |
| **Course Code** | NCC-404 (P) |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 2nd | **Semester** | 4th | **Credits** | L | T | P | C |
| | | | | | 2 | 0 | 2 | 4 |
| **Course Type** | Lab only | | | | | | | |
| **Course Category** | Generic Elective | | | | | | | |
| **Pre-Requisite/s** | Should be acquainted with the basics knowledge of General Awareness about Leadership Quality, Personality Development, Defense system etc | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Appreciate grace and dignity in the performance of foot drill. **()**<br>**CO2-** Apply signals in there day to day functioning. **()**<br>**CO3-** Provide first aid during the emergencies. **()**<br>**CO4-** Navigate to the given location on ground using compass and GPS. **()**<br>**CO5-** Practice healthy practices for the personal sanitation and hygiene. **()** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✓<br>Environment ✕ | | **SDG (Goals)** | SDG3(Good health and well-being)<br>SDG4(Quality education)<br>SDG11(Sustainable cities and economies)<br>SDG13(Climate action) | | | | |

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1. Drill | (i) Arm Drill. (ii) Salami Shastra. (iii) Squad Drill with Arms. | | |
| Unit 2.Weapon Training | (i) Range procedure & Theory of group. (ii) Short Range firing. | | |
| Unit 3. Map Reading | (i) Map to Ground. (ii) Ground to Map. | | |
| Unit 4. Field Craft & Battle Craft | (i) Fire and Move Capsule. (ii) Field signal- with hand, with Weapons, Signal with Whistle. (iii) Field signals as means of giving orders. (iv) Field signals by day, Field signals by night. (v) Section Formation. | | |
| Unit 5. Social Service and Community Development | Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc as per the requirement and similar announced days- National and State level. | | |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 0 | 0 | 0 | 0 | 0 | 0 |

## Part E

| | |
|---|---|
| **Books** | R Gupta ; NCC National Cadet Corps A, B & C Certificate Examination Book; Ramesh Publishing House, 2018. Singh, Neeraj; A Hand Book of NCC; Kanti Prakashan Publisher Cadet training hand book specialised subjects (2017) |
| **Articles** | https://indiancc.mygov.in/ |
| **References Books** | Cadets training handbook common subjects (2017), D.G NCC Delhi-110030 DG, NCC Training directive |
| **MOOC Courses** | |
| **Videos** | https://www.youtube.com/watch?v=eBA5t4iepAA |

Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Netwrok Security |
| **Course Code** | BCA 501 (T) |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 3rd | **Semester** | 5th | **Credits** | L | T | P | C |
| | | | | | 3 | 0 | 1 | 4 |
| **Course Type** | Embedded theory and lab | | | | | | | |
| **Course Category** | Disciplinary Major | | | | | | | |
| **Pre-Requisite/s** | • Basic knowledge of computer Network • You need to have a decent understanding of the basics of TCP/IP. • You should know the difference between IP, ICMP, TCP, and UDP. • You should know what port numbers and sequence numbers are, and have (some) understanding of the TCP flags. | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** • Undertake routine tasks to secure a network. **(BL1-Remember)**<br>**CO2-** • Understand the factors that place an internet-based information system at risk and apply this knowledge to simple case studies. **(BL2-Understand)**<br>**CO3-** • Evaluate procedures to secure a system against failure, theft, invasion and sabotage. **(BL3-Apply)**<br>**CO4-** • Understand and apply the concepts for administrating a small company's network. **(BL4-Analyze)**<br>**CO5-** Design the security framework using multiple Cryptography techniques**(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG1(No poverty)<br>SDG2(Zero hunger)<br>SDG4(Quality education)<br>SDG8(Decent work and economic growth) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| 1 | Introduction: Computer Security Concepts, Attacks, Services and Mechanisms, Security Attacks, types of attacks- Layer and cryptography-Authorization-Key, Security Services, Integrity check, Cipher Model, Substitution Techniques, Transposition Techniques, Viruses. | Lecturing | 12 |
| 2 | Introduction to Cryptography: Fundamentals Principles of Cryptography, Quantum cryptography, Introduction- Secret Key cryptography, Public Key Cryptography, Security Services. Conventional Encryption: Classical Techniques, Conventional Encryption Model, Stegenography, Classical Encryption Techniques. Modern Techniques: Data Encyption Standard (DES), Triple DES, Block Cipher Principles, DES Standard, DES Strength, Block Cipher Modes of Operation. | Lecturing | 10 |
| 3 | Public key Cryptography And Authentication: Public Key Encryption: Public-Key Cryptography: Principles Of Public-Key Cryptosystems, RSA Algorithm, Key Management, Public-Key Infrastructure(PKI), Fermat's & Euler's Theorem, Diffie-Hellman, Authentication: Password based Authentication, Address based Authentication, Cryptographic Authentication Protocols, Passwords as Cryptographic Keys, Trusted Intermediaries, Multiple Trusted Intermediaries and Session Key Establishment. | Lecturing | 9 |
| 4 | Hash function and Digital Signature Message authentication and Hash function: Hash function, Requirements, Security, Hash algorithm: MD5 message digest algorithm, Digital signature, Digital Signature Standard., X.509 certificates. | Lecturing | 8 |
| 5 | Web and System Security Web- Security, Threats, Secure Sockets Layers (SSL), Electronic mail security: Pretty Good privacy, S/MIME, IP Security Overview, IP Security Architecture: Authentication Header, ESP, Firewalls, System Security, Viruses, Malicious Program, Nature of Viruses, Types Of Viruses, mutual | Lecturing BPL | 6 |

# List of Experiments

| S *NO.* | **Index** |
|---|---|
| 1 | Study of different wireless network components and features of any one of the Mobile Security Apps. |
| 2 | Study of the features of firewall in providing network security and to set Firewall Security in windows. |
| 3 | Steps to ensure Security of any one web browser (Mozilla Firefox/Google Chrome). |
| 4 | Study of different types of vulnerabilities for hacking a websites / Web Applications. |
| 5 | Analysis the Security Vulnerabilities of E-commerce services. |
| 6 | Analysis the security vulnerabilities of E-Mail Application. |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | William Stallings, (2013), "Cryptography and Network Security: Principles and Practice", Prentice Hall, New Jersey. |
| **Articles** | |
| **References Books** | . AtulKahate, (2011)' "Cryptography and Network Security", TMH1. Johannes A. Buchmann (2007), "Introduction to cryptography", Springer- Verlag. |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | 2 | 2 |
| CO2 | 1 | - | - | 3 | 2 | 2 | - | 2 | - | - | - | - | 2 | 3 | 2 |
| CO3 | 1 | 2 | - | 3 | 2 | 2 | 3 | 2 | - | 1 | - | - | 3 | 3 | 2 |
| CO4 | - | 2 | - | 2 | 1 | - | - | - | - | - | - | - | 1 | - | 3 |
| CO5 | - | 2 | 1 | - | - | - | - | - | - | - | - | - | 3 | 2 | 3 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | AI and its Applications |
| **Course Code** | BCA 502 A |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 3rd | **Semester** | 5th | **Credits** | L | T | P | C |
| | | | | | 4 | 0 | 0 | 4 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Generic Elective | | | | | | | |
| **Pre-Requisite/s** | General programming concepts, understanding of software systems, Software engineering process, Logic. | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Remember**(BL1-Remember)**<br>**CO2-** Understand**(BL2-Understand)**<br>**CO3-** Analyze**(BL3-Apply)**<br>**CO4-** Apply**(BL4-Analyze)**<br>**CO5-** Create**(BL6-Create)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✓<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG1(No poverty)<br>SDG2(Zero hunger)<br>SDG8(Decent work and economic growth) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit -1 | General Issues and Overview of AI The AI problems, what is an AI technique, Characteristics of AI applications. Introduction to LISP programming: Syntax and numeric functions, Basic list manipulation functions, predicates and conditionals, input output and local variables, iteration and recursion, property lists and arrays | Lecturing | 12 |
| Unit 2 | Problem Solving, Search and Control Strategies: General problem solving, production systems, control strategies forward and backward chaining, exhaustive searches depth first breadth first search. Heuristic Search Techniques Hill climbing, branch and bound technique, best first search & A* algorithm, AND / OR graphs, problem reduction & AO* algorithm, constraint satisfaction problems. | Lecturing | 10 |
| Unit 3 | Knowledge Representations : First order predicate calculus, skolemization, resolution principle & unification, interface mechanisms, horn's clauses, semantic networks, frame systems and value inheritance, scripts, conceptual dependency. | Lecturing | 10 |
| Unit 4 | Natural Language processing Parsing techniques, context free grammar, recursive transitions nets (RNT), augmented transition nets (ATN), case and logic grammars, symantic analysis.Game playing Minimax search procedure, alpha-beta cutoffs, additional refinements. Planning: Overview an example domain the block word, component of planning systems, goal stack planning, non linear planning. | Case Study | 7 |
| Unit 5 | Probabilistic Reasoning and Uncertainty Probability theory, bayes theorem and bayesian networks, certainty factor. Expert Systems: Introduction to expert system and application of expert systems, various expert system shells, vidwanframe work, knowledge acquisition, case studies, MYCIN. Learning: Rote learning, learning by induction, explanation based learning. | Case Study | 6 |

Part C

# Case Study

**Rules/Instructions**

- Students are required to prepare Case study on any one of the topic.
- Typed (Properly formatted , at least 20 Pages with front page and index , summary )
- Students are required to upload the signed copy of case study on LMS within time line.
- It is an individual activity

**Topic : 1.** Exploring the Role of Machine Learning in Financial Fraud Detection: A Case Study of Credit Card Companies

It must consists of following points-

- Overview of types of frauds in the field of digital transactions.
- Emphasis should be given on literature review with respect to role of machine leaning in fraud detection as well as prevention.
- Supporting data survey by the reputed organization/Journals can be added to case study.
- References

Topic : 2

An Analysis of the Effectiveness of Expert Systems in Improving Decision Making in the Healthcare Industry

It must consist of following points -

- Key features of expert system.
- Architecture used in expert system
- Examples of expert system.
- Comparative study of expert systems used in healthcare Industry using literature survey.
- Results in graphs illustrating effectiveness of expert system in Improving Decision Making in the Healthcare Industry
- References

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | Elaine Rich and Kevin Knight “Artificial Intelligence”-Tata McGraw Hill. Artificial intelligence” 4 ed. Pearson. |
| **Articles** | |
| **References Books** | Dan W. Patterson “Introduction to Artificial Intelligence and Expert Systems”, Prentice India.<br>Nils J. Nilson “Principles of Artificial Intelligence”, Narosa Publishing House.<br>M.Sasikumar,S.Ramani etc. “Rule based Expert System”, Narosa Publishing House. |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | 2 | 3 | 1 | 2 | 1 | 2 | - | - | - | 1 | - | - | - |
| CO2 | - | 3 | 3 | 2 | 3 | - | - | - | 1 | - | - | 1 | - | - | - |
| CO3 | - | 3 | 3 | 2 | 3 | 2 | 2 | 1 | 1 | - | - | 1 | - | - | - |
| CO4 | - | 3 | 2 | 2 | 3 | - | - | - | 2 | - | - | 1 | - | - | - |
| CO5 | - | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | - | - | 1 | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Cloud Computing |
| **Course Code** | BCA 502(B) |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 3rd | **Semester** | 5th | **Credits** | L | T | P | C |
| | | | | | 4 | 0 | 0 | 4 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Generic Elective | | | | | | | |
| **Pre-Requisite/s** | To understand the contents and successfully complete this course, a participant must have a basic understanding of Storage Systems, Operating systems, Networking and Database. | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** To remember the various technologies for information storage and management. **(BL1-Remember)**<br>**CO2-** To understand the storage techniques, concepts of data center, data center infrastructure management and services. **(BL2-Understand)**<br>**CO3-** To implement the setup of storage techniques such as RAID, LUN Masking at data center. Create the virtual server and virtualize the resources as on demand.**(BL3-Apply)**<br>**CO4-** To analyze the functionality of data center or storage infrastructure as per policies. **(BL4-Analyze)**<br>**CO5-** To evaluate the performance of data center or storage infrastructure on various performance parameters. **(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✓<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG1(No poverty)<br>SDG3(Good health and well-being)<br>SDG4(Quality education)<br>SDG8(Decent work and economic growth)<br>SDG10(Reduced inequalities) | | | | |

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| 1 | Introduction to Storage Technology: Data proliferation, evolution of various storage technologies, Overview of storage infrastructure components, Information Lifecycle Management, Data categorization | Lecture with PPT, Audio/Video clips, Pictures, Quiz, Present Report | 12 |
| 2 | Storage Systems Architecture: Intelligent disk subsystems overview, Contrast of integrated vs. modular arrays, Component architecture of intelligent disk subsystems, Disk physical structure components, properties, performance, and specifications, RAID levels, hot sparing | Lecture with PPT, Audio/Video clips, Pictures, Quiz, implementation on cloud tools | 12 |
| 3 | Introduction to Networked Storage: JBOD, DAS, NAS, SAN & CAS evolution and comparison. Applications, Elements, connectivity, standards, management. | Lecture with PPT, Audio/Video clips, Pictures, Quiz, Examples of real-life applications such as YouTube, Facebook, Instagram, WhatsApp, LinkedIn etc., | 12 |
| 4 | Hybrid Storage solutions; Virtualization: Memory, network, server, storage & appliances. Data center concepts & requirements, Backup & Disaster Recovery: Principles | Lecture with PPT, Audio/Video clips, Pictures, Quiz, Demonstration of third-party cloud environment | 12 |
| 5 | Information storage on cloud: Concept of Cloud, Cloud Computing, storage on Cloud, Cloud Vocabulary, Architectural Framework, Cloud benefits, Cloud Computing Evolution, Applications & services on cloud, Cloud service providers and Models, Essential characteristics of cloud computing, Cloud Security and integration. | Lecture with PPT, Audio/Video clips, Pictures | 12 |

## Part D(Marks Distribution)

| **Theory** | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | G. Somasundaram, Alok Shrivastava (EMC Education Services) Editors; Information Storage and Management: Storing, Managing, and Protecting Digital Information; Wiley India.<br>Rajkumar Buyya, Christian Vecchiola, S. Thamarai Selvi; Mastering Cloud Computing, Elsevier<br>Ulf Troppens; Storage Network Explained: Basic and Application of SAN, NAS; Wiley India. |
| **Articles** | |
| **References Books** | Nick Antonopoulos, Lee Gillam; Cloud Computing: Principles, System & Application, Springer.<br>John W. Rittinghouse, James F. Ransome; Cloud Computing: Implementation, Management and Security, CRC Press - Taylor Francis Publication. |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | - | - | - | - | - | - | - | - | - | - | - | 1 | 2 | 1 |
| CO2 | 1 | 1 | - | - | 1 | - | 3 | - | - | - | - | 2 | 2 | 2 | 1 |
| CO3 | 1 | 2 | 2 | 2 | 2 | - | 3 | - | - | - | - | 2 | 3 | 3 | 2 |
| CO4 | 1 | 3 | 2 | 2 | 2 | - | 2 | - | - | - | - | 2 | 3 | 2 | 2 |
| CO5 | - | 3 | 2 | 2 | 2 | - | 2 | - | 2 | - | - | 2 | 3 | 3 | 3 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Information Retrieval |
| **Course Code** | BCA 502(C) (T) |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 3rd | **Semester** | 5th | **Credits** | L | T | P | C |
| | | | | | 4 | 0 | 0 | 4 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Generic Elective | | | | | | | |
| **Pre-Requisite/s** | Basic knowledge of Mathematics, Programming language | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Illustrate the different query properties **(BL1-Remember)**<br>**CO2-** Compare different search engine ranking techniques.**(BL2-Understand)**<br>**CO3-** Analyze the different retrieval metrics for retrieval evaluation. **(BL3-Apply)**<br>**CO4-** Construct a search engine.**(BL4-Analyze)**<br>**CO5-** Describe different ontology and taxonomy architectures and processes.**(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG1(No poverty)<br>SDG3(Good health and well-being)<br>SDG4(Quality education)<br>SDG8(Decent work and economic growth)<br>SDG10(Reduced inequalities) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| 1 | Information Retrieval Early Developments, Information Retrieval in Libraries and Digital Libraries, IR at the Center of the Stage, The IR Problem, The IR System, The Web Modeling: | Lecturing | 10 |
| 2 | Introduction, Retrieval Metrics, Implicit Feedback Through Global Analysis, Query Expansion based on a Similarity Thesaurus, Query Expansion based on a Statistical Thesaurus. | Lecturing with experimental learning | 7 |
| 3 | Web Retrieval and Web Crawling Introduction, The Web, Search Engine Architectures, Search Engine Ranking, Managing Web Data, Search Engine User Interaction, Browsing, Beyond Browsing, Web Crawling. | Lecturing | 7 |
| 4 | Web Retrieval and Web Crawling Introduction, The Web, Search Engine Architectures, Search Engine Ranking, Managing Web Data, Search Engine User Interaction, Browsing, Beyond Browsing, Web Crawling | Lecturing | 8 |
| 5 | Taxonomy and Ontology: Creating domain specific ontology, Ontology life cycle Distributed and Parallel IR: Relationships between documents, Identify appropriate networked collections, Multiple distributed collections simultaneously, Parallel IR - MIMD Architectures, Distributed IR – Collection Partitioning, Source Selection, Query Processing | Lecturing experimental learning | 8 |

Part C

ITM UNIVERSITY
GWALIOR • MP • INDIA
"CELEBRATING DREAMS"

**Project Base Learning**
**Information Retrieval**
**BCAH 502**
**Experiential Learning**

| S.no | Activity Details | Outcomes of the Activity |
|---|---|---|
| | | |
| 1 | Define IR Problem, IR System, Web Modelling. | This activity help to study for better understanding of IR system and web Modelling |
| 2 | Introduction of Retrieval Metrics, Implicit Feedback. | This activity help to understanding of Retrieval Metrics, Implicit Feedback. |
| 3 | What is Web Crawling? | This activity help to understanding web Crawling function. |
| 4 | Describe Search Engine Architectures in detail | This activity will help to understanding the Search Engine Architectures |
| 5 | What is Search Engine Ranking? | This activity will help to understanding the Search Engine ranking. |
| 6 | Define Taxonomy and Ontology in information Retrieval | This activity will help to understanding the Taxonomy and Ontology in information Retrieval. |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | Baeza-Yates, R., & Ribeiro-Neto, B. (1991). Modern Information Retrieval: The Concepts and Technology behind Search (2nd ed.). Addison Wesley. |
| **Articles** | |
| **References Books** | Büttcher, S., Clarke, C., & Cormack, G. V. (2010). Information Retrieval: Implementing and Evaluating Search Engines. |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO2 | 3 | - | - | - | - | - | - | - | - | 2 | - | - | - | - | - |
| CO3 | 3 | 3 | - | - | - | - | - | - | - | 2 | - | - | - | - | - |
| CO4 | 3 | 3 | - | - | - | - | - | - | - | 2 | - | 2 | - | - | - |
| CO5 | 3 | 3 | - | - | - | - | - | - | - | 2 | - | 2 | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Mobile Application Development |
| **Course Code** | BCA 503-A(T) |

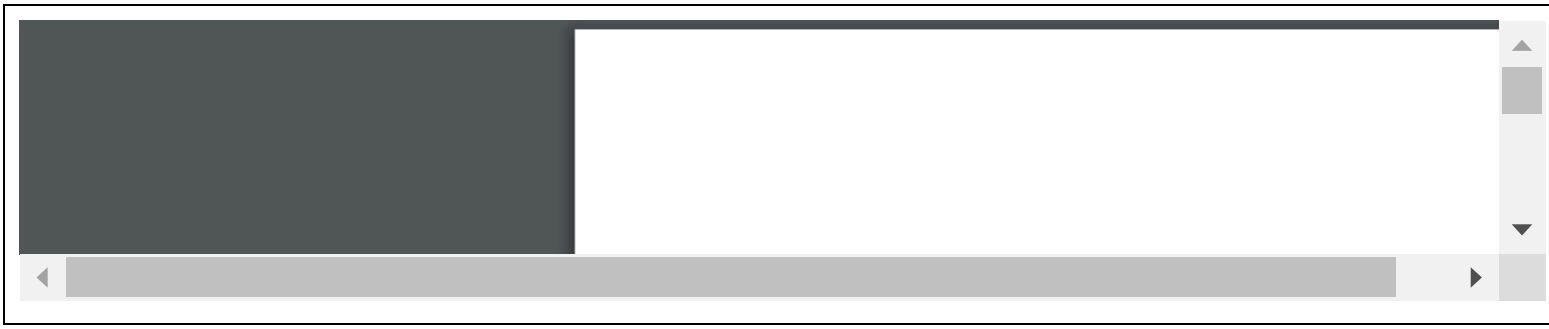
Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 3rd | **Semester** | 5th | **Credits** | L | T | P | C |
| | | | | | 3 | 0 | 1 | 4 |
| **Course Type** | Embedded theory and lab | | | | | | | |
| **Course Category** | Generic Elective | | | | | | | |
| **Pre-Requisite/s** | Prerequisites - Having the little overview about the object-oriented programming. | | | **Co-Requisite/s** | Prerequisites - Having the little overview about the object-oriented programming. | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** To remember various syntax rules of the programming language such as java and XML**(BL1-Remember)**<br>**CO2-** CO2: To understand Object Oriented concepts for Android and various mobile application development concepts including interface designing, handling multiple activities. **(BL2-Understand)**<br>**CO3-** To implement XML, Java and mysql for database connectivity and file system.**(BL3-Apply)**<br>**CO4-** To analyze various widgets and learn to use them as per the problem.**(BL4-Analyze)**<br>**CO5-** To develop solutions for real world problems using android application development. **(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✓<br>Employability ✓<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG1(No poverty)<br>SDG2(Zero hunger)<br>SDG3(Good health and well-being)<br>SDG4(Quality education)<br>SDG8(Decent work and economic growth)<br>SDG11(Sustainable cities and economies) | | | | |

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| 1 | Getting Started with Android - Introduction to Android: The Android Platform, Android SDK, Eclipse Installation, Android Installation, Building you First Android application, Understanding Anatomy of Android Application, Android Manifest file | Lecturing | 9 |
| 2 | Android Application Design Essentials - Android terminologies, Application Context, Activities, Services, Intents, Receiving and Broadcasting Intents, Android Manifest File and its common settings, Using Intent Filter, Permissions. Activity States and Life Cycle. XML : Tage, Namespaces. | Lecturing | 9 |
| 3 | Building Blocks of Mobile Apps - Android User Interface Design Essentials: User Interface Screen elements, Designing User Interfaces with Layouts, Drawing and Working with Animation. | PBL | 9 |
| 4 | SQLite (DBMS) Shared Preferences, Mobile Databases such as SQLite, Testing Android applications, Publishing Android application, Using Android preferences, Managing Application resources in a hierarchy, working with different types of resources. | Case Study | 9 |
| 5 | Using Common Android APIs: Using Android Data and Storage APIs, Sharing Data between Applications with Content Providers, Using Android Networking APIs, Using Android Web APIs, Using Android Telephony APIs, Deploying Android Application to the World. | Lecturing | 9 |

## Part C



## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | Android Wireless Application Development |
| **Articles** | |
| **References Books** | Charlie Collins, Michael D.Galpin, Matthias Kappler Android in Practice DreamTech Press 2016 |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 2 |
| CO2 | 1 | - | - | - | 2 | - | - | - | - | - | - | - | 3 | 2 | 2 |
| CO3 | 2 | - | - | - | 1 | - | 2 | - | - | - | - | - | 3 | 2 | 2 |
| CO4 | - | - | - | 2 | 2 | 2 | - | 2 | - | - | 1 | 1 | 2 | 2 | 2 |
| CO5 | - | - | 1 | - | - | 2 | - | 1 | - | - | - | - | 2 | 2 | 2 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Data Analytics |
| **Course Code** | BCA 503-B(T) |

Part A

<table>
<tr><td rowspan="2">Year</td><td rowspan="2">3rd</td><td rowspan="2">Semester</td><td rowspan="2">5th</td><td rowspan="2">Credits</td><td>L</td><td>T</td><td>P</td><td>C</td></tr>
<tr><td>3</td><td>0</td><td>1</td><td>4</td></tr>
<tr><td>Course Type</td><td colspan="8">Embedded theory and lab</td></tr>
<tr><td>Course Category</td><td colspan="8">Discipline Specific Elective</td></tr>
<tr><td>Pre-Requisite/s</td><td colspan="4">Knowledge of basic python programming.</td><td>Co-Requisite/s</td><td colspan="3"></td></tr>
<tr><td>Course Outcomes & Bloom's Level</td><td colspan="8">CO1- To understand the fundamentals of Big Data. (BL1-Remember)<br>CO2- To know about the different tools for Big Data and Visualization.(BL2-Understand)<br>CO3- To explore tools and practices for big data and Visualization.(BL3-Apply)<br>CO4- To recognize the role of business intelligence and visualization in decision making. (BL4-Analyze)<br>CO5- To analyze data using Power BI, Tableau etc. (BL5-Evaluate)<br>CO6- To prepare design dashboard for presenting analytics from data. (BL6-Create)</td></tr>
<tr><td>Coures Elements</td><td colspan="3">Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✓<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕</td><td>SDG (Goals)</td><td colspan="4">SDG4(Quality education)</td></tr>
</table>

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit-1 | Introduction To Data Handling - Overview of Data analysis, Working with statistical formulas - Logical and financial functions, Data Validation & data models, Power Map for visualize data. | Lecturing | 9 |
| Unit-2 | Introduction To Data Manipulation - Using Function: Introduction to Power BI using data, Heat Map, Tree Map, Smart Chart, Column Chart, Line Chart, Pie, Bar, Area, Scatter Chart, Data Series, Chart Sheet , Trend line, Error Bars, What-If Analysis. | Lecturing,Experiments | 9 |
| Unit-3 | Data Visualization: Getting Start With Tableau &Amp; Power BI: Getting start with Tableau & Power BI: What is Tableau? What does the Tableau product suite comprise of? How Does Tableau Work? Tableau Architecture, What is My Tableau Repository? Connecting to Data & Introduction to data source concepts, Understanding the Tableau workspace, Dimensions and Measures, Data Types & Default Properties. Creating Dataset from data model in Power BI. | Lecturing,Experiments | 9 |
| Unit-4 | Data Strategy Understanding Product & Category, Competitive Analysis, Market Share understanding - Market potential Index, Seasonality-Sales Trending. | Lecturing,PBL | 9 |
| Unit-5 | Consumer behaviour Analytics - mind and market factors, Budget planning & Execution-MIMI, Regression Correlation Analysis for Sales trending. | Lecturing,PBL | 9 |

Part C

# BCA 503(B)-Elective-II

# Data Analytics

## List of Experiments

1. Install, configure and run python, numPy and Pandas.
2. Install, configure and run Hadoop and HDFS.
3. Visualize data using basic plotting techniques in Python.
4. Implement NoSQL Database Operations: CRUD operations, Arrays using MongoDB.
5. Implement Functions: Count – Sort – Limit – Skip – Aggregate using MongoDB.
6. Implement word count / frequency programs using MapReduce.
7. Implement a MapReduce program that processes a dataset.
8. Implement clustering techniques using SPARK.
9. Implement an application that stores big data in MongoDB / Pig using Hadoop / R.

# PBL Submission Guideline

**Subject Name: Data Analytics BCA 503 B**

**Total Marks : 30**

| Sr. No. | Submission to be done | Submission Required | Marks Allotment |
|---|---|---|---|
| 1 | Select Project Topic and team submission | Small presentation | 2 |
| 2 | Introduction & Objective of Project | PBL file | 3 |
| 4 | Background Study and the existing gap in particular area | PBL file | 5 |
| 5 | System Design (Flowcharts/Block Diagrams/ Algorithms/DFD/ERdiagrams),Implementation of code, and submission of Running model. | PBL File & Implementation | 10 |
| 7 | Final Project file submission (Strictly as per the format) | Presentation & Viva Voce | 10 |

**Topic List:**

Create PBL on any given Topic

1. Traffic control using Big Data
2. Search Engine
3. Medical insurance fraud detection
4. Data warehouse design for an E-Commerce site
5. Big Data Cyber security
6. Crime Detection
7. Disease prediction based on symptom
8. Recommendation System
9. Anomaly detection in Cloud Servers
10. Smart cities using Big Data
11. Tourist behavior analysis
12. Web Server Log analysis

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | Eaton, C., Deroos, D., et al. (2017). Understanding Big Data. McGraw-Hill. |
| **Articles** | |
| **References Books** | Prajapati, V. (2016). Big Data Analytics with R and Hadoop. Packt Publishing. |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | - | - | 1 | 2 | 2 | - | - | - | - | - | - | 2 | 3 | 3 |
| CO2 | 3 | - | 1 | 1 | 2 | 3 | - | - | - | - | - | - | 2 | 3 | 2 |
| CO3 | 3 | 2 | 2 | 1 | 2 | 2 | - | - | - | - | - | - | 2 | 3 | 3 |
| CO4 | 3 | 3 | 1 | 2 | 2 | - | - | - | - | - | - | - | 2 | 3 | 3 |
| CO5 | 2 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | - | 2 | 3 | 2 |
| CO6 | 2 | 3 | 2 | 2 | 2 | - | - | - | - | - | - | - | 2 | 3 | 3 |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Ethical Hacking Fundamentals |
| **Course Code** | BCA 503-C(T) |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 3rd | **Semester** | 5th | **Credits** | L | T | P | C |
| | | | | | 3 | 0 | 1 | 4 |
| **Course Type** | Embedded theory and lab | | | | | | | |
| **Course Category** | Discipline Specific Elective | | | | | | | |
| **Pre-Requisite/s** | : An attendee of this course must have knowledge of Computer system and its components and should understand the types of data and data storage in computer system. Must be familiar with Linux Operating system, communication network and must have knowledge of Python or any other scripting language. | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** An attendee will be able to remember the basics of computer networks, Network security, Threats in a network, social networks, attack domains and will be able to remember the defense mechanisms against all attacks. **(BL1-Remember)**<br>**CO2-** An attendee will understand the risks of being on network and possible attacks that can be done on a machine over internet gaining access on devices over network, social networks IOT Devices and methods to secure them.**(BL2-Understand)**<br>**CO3-** An attendee will be able to Apply the concepts learnt to identify the hardware and software vulnerabilities in sandbox environment, deploy an attack and will be able to develop countermeasures against attack vectors identified.**(BL3-Apply)**<br>**CO4-** An attendee will be able to analyze the methods used to deploy an attack and design preventive measures for network devices against various attacks and learn about their functionalities.**(BL4-Analyze)**<br>**CO5-** An attendee will be able to evaluate the methods used to exploit the attack vectors open for attacks over the network and record their performance in all possible domains. **(BL5-Evaluate)**<br>**CO6-** An attendee will be able to Create / design systems/algorithms for identifying attacks, reporting them and preventing them over the communication network.**(BL6-Create)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG1(No poverty)<br>SDG2(Zero hunger)<br>SDG3(Good health and well-being)<br>SDG4(Quality education)<br>SDG8(Decent work and economic growth)<br>SDG11(Sustainable cities and economies) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| 1 | Information Security Fundamentals, Cyber Kill Chain Methodology, Hacking Concepts and Hacker Classes, Different Phases of Hacking Cycle, Ethical Hacking Concepts, Scope, and Limitations, Ethical Hacking Tools, Threat and Threat Sources, Malware and its Types, Vulnerabilities, Vulnerability Assessment. | Whiteboard, PPT, Programming Labs | 8 |
| 2 | Password Cracking Techniques and Countermeasures, Password Cracking Techniques, Password Cracking Tools, Password Cracking Countermeasures, Social Engineering Concepts and its Phases, Social Engineering Techniques, Insider Threats and Identity Theft, Social Engineering Countermeasures. | Whiteboard, PPT, Programming Labs | 8 |
| 3 | Sniffing, Packet Sniffing Concepts, Sniffing Techniques, Sniffing Countermeasures, Denial-of-Service, DoS and DDoS Attacks, DoS and DDoS Attack Countermeasures, Session Hijacking, Session Hijacking Attacks, Session Hijacking Attack Countermeasures, Web Server Attacks, Web Server Attacks, Web Server Attack Countermeasures, Web Application Attacks, Web Application Architecture and Vulnerability Stack, Web Application Threats and Attacks, Web Application Attack Countermeasures, SQL Injection Attacks, SQL Injection Attacks, SQL Injection Attack Countermeasures. | Whiteboard, PPT, Programming Labs | 8 |
| 4 | Wireless Terminology, Wireless Encryption, Wireless Network-Specific Attack Techniques, Bluetooth Attacks, Wireless Attack Countermeasures, Mobile Attack Anatomy, Mobile Platform Attack Vectors and Vulnerabilities, Mobile Device Management (MDM) Concept, Mobile Attack Countermeasures. | Whiteboard, PPT, Programming Labs | 8 |
| 5 | IoT Attacks, IoT Concepts, IoT Threats and Attacks, IoT Attack Countermeasures, OT Attacks, OT Concepts, OT Threats and Attacks, OT Attack Countermeasures. Cloud Computing Concepts, Container Technology, Cloud Computing Threats, Cloud Attack Countermeasures. Fundamentals of Penetration Testing and its Benefits, Strategies and Phases of Penetration Testing, Guidelines and Recommendations for Penetration Testing. | Whiteboard, PPT, Programming Labs | 8 |

## Part C

| Modules | Title | Indicative-ABCA/PBL/ Experiments/Field work/ Internships | Bloom's Level | Hours |
|---|---|---|---|---|
| 1-2 | Assignment | Experiments | BL2-Understand | 8 |
| 3-4 | Activity | Experiments | BL3-Apply | 10 |
| 1-5 | Project | Case Study | BL4-Analyze | 15 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | Matt Walker CEH Certified Ethical Hacker All-in-One Exam Guide, Second Edition 2nd Edition |
| **Articles** | Patrick Engebretson The Basics of Hacking and Penetration Testing: Ethical Hacking and Penetration Testing Made Easy (Syngress Basics Series) 1st Edition Syngress Basics Series |
| **References Books** | Hein Smith (Author), Hilary Morrison (Author) Ethical Hacking: A Comprehensive Beginners Guide to Learn and Master Ethical Hacking |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | 2 | 1 | - | - | - | - | - | - | - | - | - | 3 | 2 | 1 |
| CO2 | 1 | 1 | 1 | 2 | 1 | - | - | - | - | - | - | - | 2 | 3 | 1 |
| CO3 | 2 | 1 | 1 | 2 | 2 | - | - | - | - | - | - | - | 3 | 2 | 1 |
| CO4 | 1 | 1 | 1 | 2 | 3 | - | - | - | - | - | - | - | 1 | 3 | 1 |
| CO5 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | - | 3 | 2 | 1 |
| CO6 | - | 2 | 1 | - | - | - | - | - | - | - | - | - | 1 | 2 | 1 |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Data Communication and Networks |
| **Course Code** | BCA 504 |

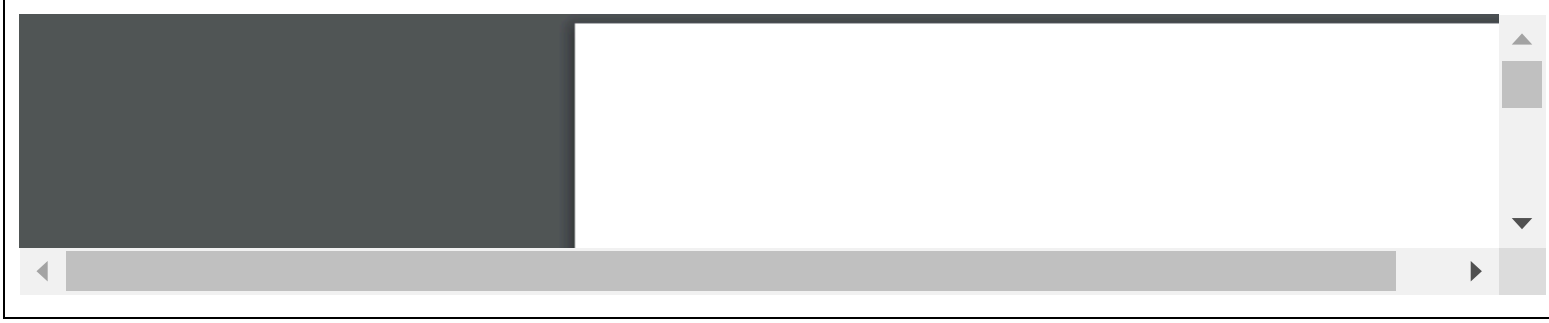
Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 3rd | **Semester** | 5th | **Credits** | L | T | P | C |
| | | | | | 4 | 0 | 0 | 4 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Disciplinary Major | | | | | | | |
| **Pre-Requisite/s** | Basic Networking Concepts: Familiarize yourself with concepts like IP addresses, subnetting, routing, and switching. Understanding the OSI (Open Systems Interconnection) model and the TCP/IP protocol suite is fundamental. | | | **Co-Requisite/s** | Basic Networking Concepts: Familiarize yourself with concepts like IP addresses, subnetting, routing, and switching. Understanding the OSI (Open Systems Interconnection) model and the TCP/IP protocol suite is fundamental. | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Remembering the concepts of computer networks, their types.**(BL1-Remember)**<br>**CO2-** Understand to the concept of Classfull and Classless addressing Network address Translation, Mobile IP.**(BL2-Understand)**<br>**CO3-** Apply to Unicast and Multicast Routing and Next Generation IP for networking.**(BL3-Apply)**<br>**CO4-** e the applications to address the issues of Networking Technologies.**(BL4-Analyze)**<br>**CO5-** Evaluating to investigate routers, IP and Routing Algorithms in Network Layer**(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | | SDG1(No poverty)<br>SDG2(Zero hunger)<br>SDG4(Quality education)<br>SDG8(Decent work and economic growth) | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| 1 | Data Communication System: Purpose, Components: Source, transmitter, transmission System, receiver, and destination. Line Configurations, Signal Representation, Parallel and Serial Data Transmission, Asynchronous and Synchronous Modes of Data Transmission. Digital Signal Encoding, Channel Coding | LECTURING | 12 |
| 2 | Analog and digital data transmission. Data and signal. Analog and digital Signaling of analog and digital data. Modem, Modulation techniques, CODEC, Digital Transmitter etc. Introduction to Network, OSI reference model, TCP/IP reference model. Transmission Media: Magnetic Media, Twisted-Pair cables, Baseband & Broadband Coaxial cables, Fiber Optics. Wireless Transmission: Radio Transmission, Microwave Transmission | PBL | 12 |
| 3 | ISDN; ATM; Data Link Layer: Services, Framing, Error Control, Error- detecting & Correcting Codes. Data Link Protocols: Stop-and-Wait Protocol, Sliding Window Protocol. HDLC; Static & Dynamic Channel allocation in LANs & MANs. Multiple Access Protocols: ALOHA, CSMA/CD | CASE STUDY | 13 |
| 4 | IEEE standards 102.3 and Ethernet, 102.4: Token Bus; 102.5: Token Ring. Bridges, Routers, Gateways, Routing Algorithm, Congestion control Algorithm, Internetworking, The TCP/IP Protocol ,IP Addressing, Subnets. | LECTURING | 13 |
| 5 | Wide Area Network: Introduction, Network routing, Routing Tables, Types of routing, Dijkstra's Algorithm, Bellman-Ford Algorithm, Link state routing, Open shortest path first, Flooding, Broadcasting, Multicasting,Internet Protocols, Overview of TCP/IP, Transport protocols, Elements of Transport Protocol, Transmission control protocol (TCP), User data- gram protocol (UDP). | LECTURING | 10 |

Part C



## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | Behrouz A. Data Communications and Networking.<br>Andrew S. Tanenbaum Computer Networks; Pearson Prentice Hall |
| **Articles** | |
| **References Books** | William J. Beyda Data Communication Prentice Hall<br>William Stallings Data and Computer Communications Pearson Prentice Hall |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 2 |
| CO2 | 1 | - | - | - | 2 | - | - | - | - | - | - | - | 3 | 2 | 2 |
| CO3 | 2 | - | - | - | 1 | - | - | 2 | - | - | - | - | 3 | 2 | 2 |
| CO4 | - | - | - | 2 | 2 | 2 | - | 2 | - | - | 1 | 1 | 2 | 2 | 2 |
| CO5 | - | - | - | 1 | - | - | 2 | - | 1 | - | - | - | 2 | 2 | 2 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Seminar |
| **Course Code** | BCA 505 |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 3rd | **Semester** | 5th | **Credits** | L | T | P | C |
| | | | | | 0 | 0 | 1 | 1 |
| **Course Type** | Soft skill | | | | | | | |
| **Course Category** | Ability Enhancement Courses | | | | | | | |
| **Pre-Requisite/s** | English language | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Co1 :To understand the importance of presentation skill **(BL2-Understand)**<br>**CO2-** CO2 : To be able to apply written presentation skills b preparing ppt **(BL3-Apply)**<br>**CO3-** CO3 : To apply oral presentation skills by presenting seminat in front of the class**(BL3-Apply)**<br>**CO4-** CO4 : To evaluate the presentation skills of other students**(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG1(No poverty)<br>SDG2(Zero hunger)<br>SDG4(Quality education)<br>SDG8(Decent work and economic growth) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| 1 | Selection of topic for Seminar , Preparing an introductory report , | ppt, discussion, Lecture | 4 |
| 2 | Writing Formal / informal report , online AI supposrted tool for writing | ppt, Discussion, Lecture | 2 |
| 3 | introduction to Micrsoft Power point , preparing PPT for the chosen topic for presentation | ppt, Discussion | 2 |
| 4 | Delivering Presentation : online tools for delivery of presentations , | ppt | |

## Part C

| Modules | Title | Indicative-ABCA/PBL/ Experiments/Field work/ Internships | Bloom's Level | Hours |
|---|---|---|---|---|
| 1 | Select a topic from the given list of topics , write a technical reprot on the topic, prepare a powerpoint presentation | Seminar | BL3-Apply | 10 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | Not applicable |
| **Articles** | |
| **References Books** | Not Applicable |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | 1 | - | - | - | - | - | 2 | - | 3 | - | - | - |
| CO2 | - | - | - | 2 | - | - | - | - | - | 3 | - | - | - | - | - |
| CO3 | - | - | - | 2 | - | - | - | - | - | 2 | - | 2 | - | - | - |
| CO4 | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Enterprice Resource Planning |
| **Course Code** | BCA 506 |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 3rd | **Semester** | 5th | **Credits** | L | T | P | C |
| | | | | | 3 | 0 | 0 | 3 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Disciplinary Major | | | | | | | |
| **Pre-Requisite/s** | | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Understand- Comprehensive knowledge of the introduction of different applications of ERP systems**(BL2-Understand)**<br>**CO2-** Applying: understand the importance of erp and be able to identify and describe typical functional modules in ERP system.**(BL3-Apply)**<br>**CO3-** Analyzing: have a case study of erp design and implementation and describe the basic concepts and technologies used in ERP.**(BL4-Analyze)**<br>**CO4-** Creating: develop projects requiring the implementation of various data structures. Students are able to understand the future scope of ERP.**(BL6-Create)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✓<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | | | | | |

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1 | Introduction: ERP Introduction, Benefits, Origin, Evolution and Structure: Conceptual Model of ERP, the Evolution of ERP, and the Structure of ERP. | Lecturing | 9 |
| Unit 2 | ERP Technologies: Business Process Reengineering, MIS, DSS, Data Warehousing, Data Mining, Online Analytic Processing (OLAP), Supply chain Management. | Lecturing | 8 |
| Unit 3 | ERP Functional Modules: Business modules, Finance, Manufacturing, Human Resources, Plant Maintenance, Materials Management, Quality Management, Sales and Distribution , Production Planning, Production Scheduling, Production Control | Lecturing | 9 |
| Unit 4 | ERP Implementation: ERP Implementation Basics, ERP Implementation Life Cycle, Role of SDLC/SSAD, Object Oriented Architecture, Consultants, Vendors and Employees | Lecturing | 9 |
| Unit 5 | ERP & E-Commerce: ERP & E-Commerce, Future Directives- in ERP, ERP and Internet, Critical success and failure factors, Integrating ERP into organizational culture. | Lecturing | 10 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | Leon. (2007). ERP Demystified, 2/e. Tata McGraw-Hill Education.<br>Garg, V. K., & Venkitakrishnan, N. K. (2003). ENTERPRISE RESOURCE PLANNING. PHI Learning Pvt. Ltd. |
| **Articles** | |
| **References Books** | |
| **MOOC Courses** | |
| **Videos** | |

Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 2 | - | - | 2 | - | - | - | - | - | - | 1 | 2 | 1 | 3 |
| CO2 | 3 | 3 | 2 | - | 2 | - | - | - | - | - | - | 2 | 3 | 1 | 2 |
| CO3 | 2 | 3 | - | 3 | 2 | - | - | - | - | - | - | 2 | 1 | 3 | 2 |
| CO4 | 2 | 2 | 3 | 2 | 3 | - | - | - | 2 | 2 | 3 | 3 | 3 | 2 | 1 |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Democracy and Good Governance |
| **Course Code** | BCA 507 |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 3rd | **Semester** | 5th | **Credits** | L | T | P | C |
| | | | | | 3 | 0 | 0 | 3 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Ability Enhancement Courses | | | | | | | |
| **Pre-Requisite/s** | | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Understand the foundational ideas of democracy by exploring various theories and theorists.**(BL2-Understand)**<br>**CO2-** Analyze the significance of decentralization in fostering grassroots level democracy in India.**(BL4-Analyze)**<br>**CO3-** Evaluate the challenges faced by democracy in India, particularly focusing on the issues concerning minority communities in society.**(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✓<br>Environment ✕ | | **SDG (Goals)** | | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit-1 | 1.1 Introduction to Democracy - Definition and principles of democracy - Historical evolution of democracy in India 1.2 Ideas of Democracy: Theories and Theorists - Overview of democratic theories (e.g., liberal democracy, participatory democracy) - Key theorists and their contributions (e.g., Amartya Sen, John Rawls) 1.3 Decentralization: Grassroots Level Democracy - Concept of decentralization and its significance in democracy - Analysis of grassroots level democracy in India: Panchayati Raj System 1.4 Challenges before Democracy: Problems of Minority Society - Identification and analysis of challenges faced by minority communities in India's democratic framework | Lecturing | 11 |
| unit-2 | 2.1 73rd and 74th Constitutional Amendment Acts - Overview of the constitutional amendments and their significance in local governance - Analysis of institutional structures established by the amendments 2.2 Local Body Elections: Urban & Rural - Comparative study of urban and rural local body elections - Electoral processes, representation, and participation in local governance 2.3 Role of State Election Commission - Functions and responsibilities of State Election Commission in conducting local body elections - Challenges and reforms in electoral administration at the local level 2.4 Duties of an Individual towards Electoral Process - Understanding the importance of citizen participation in electoral processes - Responsibilities of citizens in ensuring free and fair elections | Case Study | 12 |
| Unit-3 | 3.1 Meaning and Concept - Definition and components of good governance - Principles guiding good governance practices 3.2 Government and Governance - Distinction between government and governance - Role of governance in promoting effective and accountable government 3.3 Good Governance Initiatives in India - Examination of key initiatives aimed at promoting good governance in India - Case studies on successful governance models at the national and state levels | Case Study | 11 |
| Unit-4 | 4.1 Globalization and Governance - Impact of globalization on governance structures and practices - Challenges and opportunities posed by globalization for governance in India 4.2 Transnationalization and Global Citizenship - Concept of transnationalization and its implications for global citizenship - Role of international organizations and global governance mechanisms 4.3 Global | Case Study | 11 |

| | | | |
|---|---|---|---|
| | Inequality and Governance - Analysis of global inequalities and their influence on governance outcomes - Strategies for addressing inequality through governance mechanisms | | |

## Part C

| Modules | Title | Indicative-ABCA/PBL/ Experiments/Field work/ Internships | Bloom's Level | Hours |
|---|---|---|---|---|
| 1-4 | Case study | PBL | | 15 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | |
| **Articles** | |
| **References Books** | |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 3 | - | - | - | 2 | 2 | 3 | - | 2 | - | 2 | 1 | - | - |
| CO2 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | - | 2 | 2 | 3 | - | 2 | - |
| CO3 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | - | 2 | 1 |
| CO4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | NCC |
| **Course Code** | NCC 0505(P) |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 3rd | **Semester** | 5th | **Credits** | L | T | P | C |
| | | | | | 0 | 0 | 1 | 1 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Generic Elective | | | | | | | |
| **Pre-Requisite/s** | Should be acquainted with the basics knowledge of General Awareness about Leadership Quality, Personality Development, Defense system etc. | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Participate in team building exercise and value team work.**()**<br>**CO2-** Improve communication skills by public speaking activities. **()**<br>**CO3-** Understand the security mechanism and management of Border/Coastal areas. **()**<br>**CO4-** Get motivated to join armed forces.**()** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✓<br>Environment ✕ | | **SDG (Goals)** | SDG3(Good health and well-being)<br>SDG4(Quality education) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1. Personality Development | (i) Group Discussions –Team work. (ii) Public speaking. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 2. Border & Coastal Areas | Security Setup and Border/Coastal management in the area | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 3. Introduction to Infantry Battalion and its Equipment | Organisation of Infantry Battalion & its weapons | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 4. Military History | Study of Battles of Indo-Pak Wars 1965 & 1971. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 5. Health & Hygiene | (i) Yoga- Introduction, Definition, Purpose, Benefits. (ii) Asanas-Padamsana, Siddhasana, Gyan Mudra, Surya Namaskar, Shavasana, Vajrasana, Dhanurasana, Chakrasana, Sarvaangasana, Halasana etc. i) Hygiene & Sanitation (Hygiene- Personal & Camp Hygiene). (ii) First Aid in common medical emergencies. (iii) Treatment & Care of Wounds. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |

Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 0 | 0 | 0 | 0 | 0 | 0 |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 40 | 12 | 60 | |

## Part E

| | |
|---|---|
| **Books** | R Gupta ; NCC National Cadet Corps A, B & C Certificate Examination Book; Ramesh Publishing House, 2018. Singh, Neeraj; A Hand Book of NCC; Kanti Prakashan Publisher Cadet training hand book specialised subjects (2017) |
| **Articles** | https://indiancc.mygov.in/ |
| **References Books** | Cadets training handbook common subjects (2017), D.G NCC Delhi-110030 DG, NCC Training directive |
| **MOOC Courses** | |
| **Videos** | https://www.youtube.com/watch?v=eBA5t4iepAA |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | NCC |
| **Course Code** | NCC 0505(T) |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 3rd | **Semester** | 5th | **Credits** | L | T | P | C |
| | | | | | 1 | 0 | 1 | 2 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Generic Elective | | | | | | | |
| **Pre-Requisite/s** | Should be acquainted with the basics knowledge of General Awareness about Leadership Quality, Personality Development, Defense system etc. | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Participate in team building exercise and value team work.**()**<br>**CO2-** Improve communication skills by public speaking activities. **()**<br>**CO3-** Understand the security mechanism and management of Border/Coastal areas. **()**<br>**CO4-** Get motivated to join armed forces.**()** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✓<br>Environment ✕ | | **SDG (Goals)** | SDG3(Good health and well-being)<br>SDG4(Quality education) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1. Personality Development | (i) Group Discussions –Team work. (ii) Public speaking. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 2. Border & Coastal Areas | Security Setup and Border/Coastal management in the area | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 3. Introduction to Infantry Battalion and its Equipment | Organisation of Infantry Battalion & its weapons | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 4. Military History | Study of Battles of Indo-Pak Wars 1965 & 1971. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 5. Health & Hygiene | (i) Yoga- Introduction, Definition, Purpose, Benefits. (ii) Asanas-Padamsana, Siddhasana, Gyan Mudra, Surya Namaskar, Shavasana, Vajrasana, Dhanurasana, Chakrasana, Sarvaangasana, Halasana etc. i) Hygiene & Sanitation (Hygiene- Personal & Camp Hygiene). (ii) First Aid in common medical emergencies. (iii) Treatment & Care of Wounds. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |

Part D(Marks Distribution)

| **Theory** | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | R Gupta ; NCC National Cadet Corps A, B & C Certificate Examination Book; Ramesh Publishing House, 2018. Singh, Neeraj; A Hand Book of NCC; Kanti Prakashan Publisher Cadet training hand book specialised subjects (2017) |
| **Articles** | https://indiancc.mygov.in/ |
| **References Books** | Cadets training handbook common subjects (2017), D.G NCC Delhi-110030 DG, NCC Training directive |
| **MOOC Courses** | |
| **Videos** | https://www.youtube.com/watch?v=eBA5t4iepAA |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Data Ware housing and mining |
| **Course Code** | BCA 601 |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 3rd | **Semester** | 6th | **Credits** | L | T | P | C |
| | | | | | 4 | 0 | 0 | 4 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Disciplinary Minor | | | | | | | |
| **Pre-Requisite/s** | Student should be familiar with Discrete Mathematics, Probability, Statistics, Data structures and basics of RDBMS. | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** To remember the Data mining techniques that help extract meaningful data.**(BL1-Remember)**<br>**CO2-** To understand the basics of Data warehouse, Data marts, data preprocessing and techniques of data mining.**(BL2-Understand)**<br>**CO3-** To implement the various methods of data mining for data clustering, classification: K-means, K- Medoids etc.**(BL3-Apply)**<br>**CO4-** To analyze the concepts of data Preprocessing, Association Rule Mining, classification, clustering.**(BL4-Analyze)**<br>**CO5-** To evaluate the data mining models that run efficiently.**(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✓<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG1(No poverty)<br>SDG2(Zero hunger)<br>SDG3(Good health and well-being)<br>SDG4(Quality education)<br>SDG8(Decent work and economic growth)<br>SDG10(Reduced inequalities) | | | | |

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| 1 | Data Warehouse Concepts: Architecture, operations, Multidimensional Data Model, Data Warehouse Implementation, Data Cube Technology, Aggregation, OLAP functions and tools. | Lecturing, Case study | 6 |
| 2 | Needs of Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation, Online Data Storage, Concept Hierarchies – Concept Description Data Generalization and Summarization Based Characterization | Lecturing, Research | 12 |
| 3 | Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Major issues in Data Mining, Data Mining Primitives, Languages, and System Architectures, Architectures of Data Mining Systems, Classification by Decision Tree Induction , Bayesian Classification. Association Rule Mining, Mining, Single-Dimension Association Rules from Transactional Databases, Mining Multilevel ,Association Rules from Transaction Databases, Mining Multidimensional Association Rules from Relational Databases and Data Warehouses, From Association Mining to Correlation Analysis, Constraint-Based Association Mining | Lecturing | 5 |
| 4 | Clusters Analysis: What is cluster analysis, Types of Data in Cluster Analysis, Categorization of Major Clustering Methods – Partitioning Methods : K-Means and K-Medoids, Hierarchical methods: Agglomerative and divisive clustering. | Lecturing ,Research | 12 |
| 5 | Applications of Data mining: Various areas of data mining with their features and specific design of mining system needed – Text Mining, | Lectures with whiteboard/PPT, Recorded video/interactive videos, | 4 |

## Part C

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | Han, J., Kamber, M., & Pei, J. (2011, June 9). Data Mining: Concepts and Techniques. |
| **Articles** | |
| **References Books** | Resources, M. A. I. (2012, November 30). Data Mining: Concepts, Methodologies, Tools, and Applications. |
| **MOOC Courses** | |
| **Videos** | Data Mining Introduction: https://www.youtube.com/watch?v=ykZ-_UGcYWgRule Generation:https://archive.nptel.ac.in/courses/106/105/106105174/ |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | - | - | - | 2 | 2 | - | - | - | 2 | - | - | - | - | 1 |
| CO2 | - | 1 | 1 | 2 | 2 | 2 | - | - | - | 2 | - | - | 1 | - | 3 |
| CO3 | 2 | - | - | - | - | - | - | - | - | - | - | - | 3 | 2 | 3 |
| CO4 | 2 | 1 | - | 2 | 1 | - | - | - | - | - | - | - | 2 | 3 | 3 |
| CO5 | 2 | 1 | - | 2 | 1 | - | - | - | - | - | - | - | 2 | 3 | 3 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Image Processing |
| **Course Code** | BCA 602 (A)(T) |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 3rd | **Semester** | 6th | **Credits** | L | T | P | C |
| | | | | | 3 | 0 | 1 | 4 |
| **Course Type** | Embedded theory and lab | | | | | | | |
| **Course Category** | Generic Elective | | | | | | | |
| **Pre-Requisite/s** | Prerequisite: student must be familiar with the following: ❖ Undergraduate level mathematics. ❖ Programming in MatLab. | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** To remember various concept of digital image processing.**(BL1-Remember)**<br>**CO2-** To understand the fundamental concepts of a digital image processing system.**(BL2-Understand)**<br>**CO3-** Apply the concepts learnt in to design and implement with Matlab algorithms for digital image processing operations such as histogram equalization, enhancement, restoration and filtering.**(BL3-Apply)**<br>**CO4-** Analyze the concept of designing after applying these techniques in various applications.**(BL4-Analyze)**<br>**CO5-** Evaluate the theoretical knowledge and practical skills on digital image processing. **(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG1(No poverty)<br>SDG2(Zero hunger)<br>SDG3(Good health and well-being)<br>SDG4(Quality education)<br>SDG8(Decent work and economic growth)<br>SDG11(Sustainable cities and economies) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| 1 | Digital Image Introduction: Steps in Digital Image Processing and the Need for Digital Image Processing, Application and Components of Image Processing System. Visual Preliminaries: Brightness Adaptation and Contrast, Neighborhood of pixel, D4, D8 and Dm distances, Adjacency, path and connectivity. | Lecturing | 15 |
| 2 | Image Processing Image Enhancement: Contrast Stretching, Smoothing, Image Averaging, Mean Filter, Ordered Statistic Filter: Median Filter, Low Pass Filtering. Image Sharpening, High, Pass Filtering, Homomorphic Filtering. | Lecture and experiments | 10 |
| 3 | Image Transformation Basic Intensity Transformation Functions, Histogram, Histogram Equalization, Histogram Matching, Spatial Correlation and Convolution Error Criterion: Lossy Compression methods, loss –less compression, Huffman coding, Run length coding- Block coding, Quad Tree coding-contour coding. | Lecture and experiments | 15 |
| 4 | Color Processing and Image Segmentation: Color Fundamentals, RGB, CMY and HSI Color Models, Image Segmentation: Edge Models, Edge Detection, Global and Variable Thresholding, Single and Multiple Thresholds, Region Based Segmentation. | Lecture and experiments | 10 |
| 5 | Morphology, Representation and Description: Mathematical Morphology, Erosion and Dilation, Opening and Closing, Boundary Extraction algorithm. Border Following Algorithm, Chain Codes, Minimum Perimeter Polygons, Boundary Descriptors, Regional Descriptors. | Lecture and experiments | 15 |

# PBL Submission Guideline

| Sr. No. | Submission to be done | Submission Required | Marks Allotment |
|---|---|---|---|
| 1 | Select Project Topic and team submission | Small presentation | 2 |
| 2 | Introduction & Objective of Project | PBL file | 3 |
| 4 | Background Study and the existing gap in particular area | PBL file | 5 |
| 5 | System Design (Flowcharts/Block Diagrams/ Algorithms/DFD/ER diagrams), Implementation of code, and submission of running model. | PBL File & Implementation | 10 |
| 7 | Final Project file submission (Strictly as per the format) | Presentation & Viva Voce | 10 |

**Topic List:**

Q Create PBL on any given Topic

- **License plate recognition**
- **Face Emotion recognition**
- **Face recognition**
- **Cancer detection**
- **Object detection**
- **Pedestrian detection**
- **Lane detection for ADAS**
- **Blind assistance systems**
- **Gesture recognition**
- **Drowsy driver detection**
- **Barcode Detection**
- **Image Enhancement and Restoration**
- **Image-to-Text Conversion**

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | Gonzalez, R. C., & Woods, R. E. (2008). Digital Image Processing (3rd ed.). Pearson Education Inc. |
| **Articles** | |
| **References Books** | Jain, A. K. (1989). Fundamentals of Digital Image Processing. Prentice Hall.<br>Gonzalez, R. C., Woods, R. E., & Eddins, S. L. (2020). Digital Image Processing using Matlab. McGraw Hill Education. |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | - | - | - | 1 | 2 | - | - | - | 2 | - | - | 2 | 2 | 1 |
| CO2 | 1 | - | - | - | 1 | 2 | - | - | - | - | - | - | 2 | 2 | 3 |
| CO3 | 2 | 2 | - | 2 | - | - | - | - | - | - | - | - | 1 | - | 2 |
| CO4 | 1 | 2 | - | 1 | - | - | - | - | - | - | - | - | 1 | 2 | 2 |
| CO5 | 1 | 2 | - | 1 | - | - | - | - | - | - | - | - | 1 | - | 2 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Machine Learning |
| **Course Code** | BCA 602(B) (T) |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 3rd | **Semester** | 6th | **Credits** | L | T | P | C |
| | | | | | 3 | 0 | 1 | 4 |
| **Course Type** | Embedded theory and lab | | | | | | | |
| **Course Category** | Generic Elective | | | | | | | |
| **Pre-Requisite/s** | Basic understanding of Statistical Data Analysis and visualization methods, and Python Programming. | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** To remember various concept of data science. **(BL1-Remember)**<br>**CO2-** To understand various Performance evaluation techniques of Machine Learning models. **(BL2-Understand)**<br>**CO3-** To implement various supervised, unsupervised and reinforcement machine Learning Models **(BL3-Apply)**<br>**CO4-** To train & test various machine Learning models using different domains of dataset. **(BL4-Analyze)**<br>**CO5-** To evaluate and summarize the performance of various machine learning models using statistical & visualization tools**(BL5-Evaluate)**<br>**CO6-** To create machine learning models to solve real world problems.**(BL6-Create)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✓<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG1(No poverty)<br>SDG2(Zero hunger)<br>SDG3(Good health and well-being)<br>SDG4(Quality education)<br>SDG8(Decent work and economic growth)<br>SDG10(Reduced inequalities)<br>SDG11(Sustainable cities and economies) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| 1 | Introduction of Machine Learning: What is Machine Learning, Need for Machine Learning, Why & When to Make Machines Learn?, Machine Learning Model, Challenges in Machines Learning, Applications of Machines Learning, Overview of various machine Learning Algorithms, Performance evaluation measures for machine learning algorithms, the curse of dimensionality, Data Feature Selection, Training Data vs. Validation Data vs. Test Data for ML Algorithms, bias-variance trade off, over fitting vs under fitting. | Lectures with whiteboard/PPT, Recorded video/interactive videos, programming labs | 12 |
| 2 | Supervised Learning-I Regression: Introduction to Regression, Types of Regression Models, Introduction to Linear Regression, Simple Linear Regression, Least square regression, Gradient Descent , Multiple Linear Regression (MLR), Regularization in Linear Regression, Ridge regression, Lasso regression, Polynomial Regression, Support Vector for Regression (SVR). | Lectures with whiteboard/PPT, Recorded video/interactive videos, programming labs | 12 |
| 3 | Supervised Learning-II Classification – Introduction to Classification, Types of Learners in Classification, Logistic Regression, K-Nearest Neighbors (K-NN), Support Vector Machine (SVM), Kernel SVM, Naive Bayes, Decision Tree Classification, Random Forest Classification. | Lectures with whiteboard/PPT, Recorded video/interactive videos, programming labs | 12 |
| 4 | Unsupervised Learning Clustering-Introduction to Clustering, Types of Clustering, Types of Clustering Algorithms, K-Means Clustering, Hierarchical Clustering, DBSCAN Clustering, Association Rule Learning: Introduction to Association Rule Learning, Types of Association Rule Learning, Apriori Algorithm, Eclat Algorithm, F-P Growth Algorithm, Applications of Association Rule Learning. | Lectures with whiteboard/PPT, Recorded video/interactive videos, programming labs | 12 |
| 5 | Reinforcement Learning: Introduction of Reinforcement Learning, Terms used in Reinforcement Learning, Key Features, Elements of Reinforcement Learning, How does Reinforcement Learning Work?, The Bellman Equation, Types of Reinforcement learning, Markov Decision Process, Reinforcement Learning Algorithms, Reinforcement Learning Applications Performance Improvement of ML Models: Performance Improvement with Ensembles, Ensemble Learning Methods, Bagging Ensemble Algorithms, Boosting Ensemble Algorithms, Voting Ensemble Algorithms. | Lectures with whiteboard/PPT, Recorded video/interactive videos, programming labs | 12 |

## Part C

| Modules | Title | Indicative-ABCA/PBL/ Experiments/Field work/ Internships | Bloom's Level | Hours |
|---|---|---|---|---|
| 1 | Implementation of various performance evaluation techniques of machine learning | Experiments | BL3-Apply | 02 |
| 2 | Implementation of various regression models of machine learning | Experiments | BL3-Apply | 04 |
| 3 | Implementation of various classification models of machine learning | Experiments | BL3-Apply | 03 |
| 4 | Implementation of various clustering models of machine learning | Experiments | BL3-Apply | 03 |
| 5 | Implementation of RL, bagging and boosting models of machine learning | Experiments | BL3-Apply | 03 |
| 1-5 | Problem Based Learning | PBL | BL6-Create | 15 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | Andreas C. Müller, Sarah Guido.(2016).Introduction to Machine Learning with Python: A Guide for Data Scientists.1st ed.O'Reilly Media. |
| **Articles** | |
| **References Books** | Tom M. Mitchell.(2017).Machine Learning.1st ed.McGraw Hill Education.<br>Dr S. Sridhar, Dr M. Vijayalakshmi.(2021).Machine Learning.1st ed. Oxford University Press.<br>Manaranjan Pradhan, U Dinesh Kumar.(2019).Machine Learning using Python.1st ed. Wiley India. |
| **MOOC Courses** | Prof. S. Sarkar.(2023).Introduction to Machine Learning, IIT Kharagpur.https://nptel.ac.in/courses/106105152 Dr. Balaraman Ravindran. (2024).Introduction to Machine Learning, IIT Madras.https://nptel.ac.in/courses/106106139 |
| **Videos** | |

Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | - | - | - | 2 | 2 | - | - | - | 2 | - | - | 1 | - | 1 |
| CO2 | 1 | 2 | 1 | 2 | 2 | 2 | - | - | - | 2 | - | - | 1 | - | 3 |
| CO3 | 2 | 1 | 1 | - | 1 | - | - | - | - | - | - | - | 3 | 2 | 3 |
| CO4 | 2 | 2 | - | 2 | 1 | - | - | - | - | - | - | - | 2 | 3 | 3 |
| CO5 | 2 | 2 | - | 2 | 1 | - | - | - | - | - | - | - | 2 | 2 | 3 |
| CO6 | 2 | 1 | 1 | 2 | 2 | - | - | - | - | 2 | - | - | 2 | 2 | 3 |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Digital Forensic Essentials |
| **Course Code** | BCA 602(C)-T |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 3rd | **Semester** | 6th | **Credits** | L | T | P | C |
| | | | | | 3 | 0 | 1 | 4 |
| **Course Type** | Embedded theory and lab | | | | | | | |
| **Course Category** | Generic Elective | | | | | | | |
| **Pre-Requisite/s** | Basic knowledge of computer fundamentals, hardware, algorithms and basic concepts of network. | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Remembering Computer Network basics and Network Defense Essentials**(BL1-Remember)**<br>**CO2-** Understand the concepts of Digital Forensics Digital investigation, Digital crime scene Evaluation process**(BL2-Understand)**<br>**CO3-** Apply to the identification of crime and investigate (apply).**(BL3-Apply)**<br>**CO4-** Analyze the data from digital devices for forensic analysis and finalize the audit report(Analyse)**(BL4-Analyze)**<br>**CO5-** Evaluating Evaluation of various crimes and the techniques applied to perform the crimes in digital world.(Investigate)**(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG1(No poverty)<br>SDG2(Zero hunger)<br>SDG3(Good health and well-being)<br>SDG4(Quality education)<br>SDG8(Decent work and economic growth)<br>SDG10(Reduced inequalities) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| 1 | Introduction to Digital Forensics Digital investigation, Digital crime scene evaluation process, Search & Seizure, Digital Forensic Lab Setup, Dead v/s Live Forensics, Types of Digital Evidences, Disk Imaging, Write Blockers, Data Recovery, Chain of Custody, Standard Operating Procedures, Investigation Guidelines, overview of tools, Slack Space, Virtual paging, Volatile Evidence Acquisition, Collection & Analysis | Lecturing, Experiments | 7 |
| 2 | Volume Analysis & File Systems Introduction, PC based partitions- DOS partitions, UNIX partitions, RAW partition, UNIX Console Log, Removable media, Server based partitions- BSD partitions, GPT & MBR partitions, multiple disk volumes- RAID, Disk Spanning, file system, File system category, FAT concepts and analysis, FAT data structure- Boot sector, FAT 32 FS info, Directory entries, Long file name directory entries, NTFS File System concepts, NTFS Analysis, NTFS data structure, Standard file attributes, Index attributes and data structures | Lecturing, Case Study, Experiments | 8 |
| 3 | Digital Evidence Analysis Potential Evidences, Evidence collection form different devices, Artifact interpretation, Operating System artifacts analysis, Network Artifacts analysis, File Signatures, Registry Forensics, Last user Activity, MRU, NTUSER.DAT, MFT concepts, MFT Forensics,Multimedia Forensics, Metadata Analysis, Browser Forensics, History Extraction, Cookies based artifacts, Autofill Forms, Cache, Temp file, MAC OS Artifacts analysis, Linux OS Artifact Analysis | Lecturing, Case Study, Experiments | 10 |
| 4 | NIX File Systems UNIX, Ext2 and Ext3 data structures, iNodes, Super block, group descriptor tables, Block bitmap, Extended attributes, Directory Entry, Symbolic Link, Hash trees, Journal data structures, UFS1 and UFS2 concepts and analysis, NFS Files Systems, HFS File Systems, CDF File systems, Hadoop File systems | Lecturing, Case Study, Experiments | 8 |
| 5 | Forensic Tools :Forensic tools collection, Automated v/s manual techniques, Open source forensic tools, Developing scripted tools for basic level investigation, Usage tools for disk imaging and Data recovery, Encase and FTK tools, Autopsy, UFED, XRY, Volatility, Rekall, RedLine, NetworkMiner, Anti forensics Techniques, Counter anti forensics. | Lecturing, Case Study, Experiments | 10 |

Part C

## Activity I

## (Digital Forensic Essentials)

## Activity type: Survey

## Individual Activity

**Guidelines:**

1. Create a questionnaire for testing general cyber security measures a layman should adopt . Each question in the questionnaire should contain one mark and should have four options for answer. No descriptive questions should be there in the questionnaire.

2. The questionnaire should contain 25 questions related to using safety measures an individual should take to safe guard his / her laptop / mobile/ tab etc.

3. In addition to these questions the questionnaire should also contain following questions which should have descriptive questions: Name, City, state, age as on 1.07.2023, gender, profession (This should be a dropdown list having following options: home maker, Service, Self-employed, student, teacher), phone no./ email id

4. The questionnaire should be shared with at least 50 people and at least 40 entries should be recorded.

5. This assignment should be created as a goggle form and the form as well as the excel sheet of responses should be uploaded as submission.

6. This is an individual activity and not a group activity.

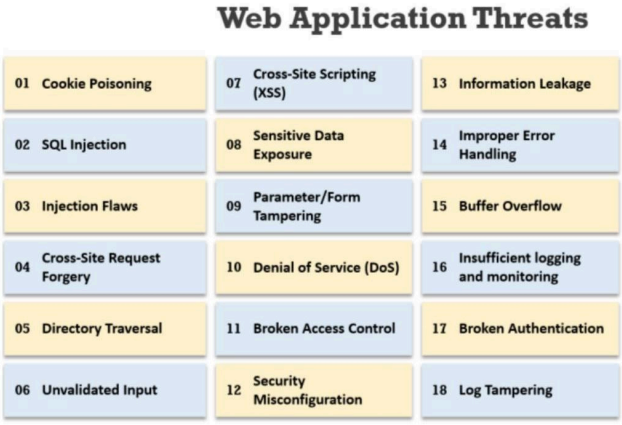
## Activity II

## (Digital Forensic Essentials)

## Case Study

**Guidelines:**

1. This is an individual activity.
2. Please refer to the following list of web application threats and select any three of them:




3. Document the following about the threats selected:
    a. Attack Surface(s)
    b. Attack Vector(s)
    c. Methodology used for attack in form of block diagram
    d. An example or case study of this kind of attack performed
    e. Ways/methods/ tools/ command to detect the attacks in following environment:
        i. Window's
        ii. Linux
4. Comparative analysis of the attacks under consideration on following parameters:
    a. Attack surfaces used
    b. IOC
    c. Possible Damage level
5. The report should be in MS- word format on an A-4 size paper.
6. The report should be submitted in soft copy online as well as hard copy

## Part D(Marks Distribution)

**Theory**

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| 100 | 40 | 60 | 18 | 40 | |

**Practical**

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| 100 | 50 | 60 | 30 | 40 | |

**Practical List**

**(Digital Forensic Essentials)**

1. Study of Computer Forensics and different tools used for forensic investigation
2. How to Recover Deleted Files using Forensics Tools
3. How to make the forensic image of the hard drive using FTK Forensics.
4. How to used sniffer tool in network forensics.
5. How to Wipe Out Activities of Your PC
6. How to prepared the RAM Dump using FTK Tool
7. How to Collect Email Evidence in Victim PC
8. Find Last Connected USB on your system (USB Forensics)
9. Live Forensics Case Investigation using Autopsy
10. Comparison of two Files for forensics investigation by Compare IT software

## Part E

**Books**

Carvey, H. A. (2014). Windows Forensic Analysis Toolkit: Advanced Analysis Techniques for Windows 7. Syngress.

**Articles**

**References Books**

Marshall, A. M. (2008). Digital Forensics: Digital Evidence in Criminal Investigation. Wiley-Blackwell.

**MOOC Courses**

**Videos**

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | - | 1 | 2 | - | - | - | - | - | - | - | - | 2 | 1 | 1 |
| CO2 | - | 1 | 1 | 1 | 2 | - | - | - | - | - | - | - | 1 | 2 | 1 |
| CO3 | 2 | 2 | 1 | 1 | 2 | - | - | - | - | - | - | - | 3 | 2 | 3 |
| CO4 | - | 2 | 1 | 2 | - | - | - | - | - | - | - | - | 2 | 1 | 3 |
| CO5 | 2 | 2 | 1 | - | 1 | - | - | - | - | - | - | - | 1 | 2 | 2 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Cyber Laws |
| **Course Code** | BCA 603-A |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 3rd | **Semester** | 6th | **Credits** | L | T | P | C |
| | | | | | 4 | 0 | 0 | 4 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Disciplinary Minor | | | | | | | |
| **Pre-Requisite/s** | General understanding of cyber space , computer network. | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Understand the structure of cyber space and network, Information Technology and law in general.**(BL2-Understand)**<br>**CO2-** Apply IT act on Pseudo case studies.**(BL3-Apply)**<br>**CO3-** Analyze the type of a digital crime with reference to the provisions in IT Act 200 and 2008.**(BL4-Analyze)**<br>**CO4-** Understand IT Act 2000 of India along with some other countries.**(BL1-Remember)**<br>**CO5-** Evaluate the impact of a digital crime on the victim and the provision punishment to the accused.**(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| 1 | Cyber Technology: Understanding the Cyber Technology, Technology and Law, Constraint and Scope of Cyber Laws Evolution of the IT Act 2000, Genesis and Necessity | Lectures with whiteboard/PPT, Recorded video/interactive videos, case study | 4 |
| 2 | Penalties &Offences under IT Act Amendments under IT Act and Impact on other related Acts (Amendments): (a) Amendments to Indian Penal Code. (b) Amendments to Indian Evidence Act. (c) Amendments to Bankers Book Evidence Act. (d) Amendments to Reserve Bank of India Act. | Lectures with whiteboard/PPT, Recorded video/interactive videos, case study | 4 |
| 3 | Cyber Appellate Tribunal with Special Reference to the Cyber Regulation Appellate Tribunal (Procedures) Rules 2000, The Information Technology (Procedures and Safeguards for Interception, Monitoring and Decryption of Information) Rules, 2009 and Corresponding International Legislation in US, UK and Europe, The Information Technology (Procedures and Safeguards for Blocking the access of Information by Public) Rules, 2009 and Corresponding International Legislation in US, UK and Europe, The Information Technology (Reasonable Security Practices and Procedures and Sensitive Personal Data or Information) Rules, 2009 and Corresponding International Legislation in US, UK and Europe | Lectures with whiteboard/PPT, Recorded video/interactive videos, practical problems | 4 |
| 4 | Cyber and Cyber Space with reference to Democracy and Sovereignty, Developments in Cyber law Jurisprudence, Role of law in Cyber World: Regulation of Cyber Space in India Cyber Space Jurisdiction (a) Jurisdiction issues under IT Act, 2000. (b) Traditional principals of Jurisdiction (c) Extra- terrestrial Jurisdiction (d) Case Laws on Cyber Space Jurisdiction (e) Taxation issues in Cyberspace | Lectures with whiteboard/PPT, Recorded video/interactive videos | 4 |
| 5 | Cyber Space Jurisdiction (a) Jurisdiction issues under IT Act, 2000. (b) Traditional principals of Jurisdiction (c) Extra- terrestrial Jurisdiction (d) Case Laws on Cyber Space Jurisdiction (e) Taxation issues in Cyberspace | Lectures with whiteboard/PPT, Recorded video/interactive videos, Practical Labs | 4 |

## Part C

| Modules | Title | Indicative-ABCA/PBL/ Experiments/Field work/ Internships | Bloom's Level | Hours |
|---|---|---|---|---|
| 1-2 | Assignment | Case Study | BL2-Understand | 2 |
| 3-4 | Quiz | PBL | BL3-Apply | 1 |
| 5 | Case Based Activity | Field work | BL4-Analyze | 4 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | Sharma, V. (2011, January 1). Information Technology Law and Practice. Universal Law Publishing. |
| **Articles** | |
| **References Books** | Duggal, P. (2014, January 1). Legal Framework on Electronic Commerce and Intellectual Property Rights in Cyberspace |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 2 |
| CO2 | 1 | - | - | - | 2 | - | - | - | - | - | - | - | 3 | 2 | 2 |
| CO3 | 2 | - | - | - | 1 | - | 2 | - | - | - | - | - | 3 | 2 | 2 |
| CO4 | - | - | - | 2 | 2 | 2 | - | 2 | - | - | 1 | 1 | 2 | 2 | 2 |
| CO5 | - | - | 1 | - | 2 | - | 1 | - | - | - | - | - | 2 | 2 | 2 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Computer GRaphics and Multimedia |
| **Course Code** | BCA 603-C |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 3rd | **Semester** | 6th | **Credits** | L | T | P | C |
| | | | | | 4 | 0 | 0 | 4 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Generic Elective | | | | | | | |
| **Pre-Requisite/s** | Basic understanding of computer fundamentals, programming in 'C', and mathematical concepts | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Toremember variousconceptsofcomputerfundamentals**(BL1-Remember)**<br>**CO2-** TounderstandtheBasicconceptofComputerGraphicsandMultimediaSystem.**(BL2-Understand)**<br>**CO3-** ToimplementvariousalgorithmsinC/C++likeDDA,Circledrawing etc.**(BL3-Apply)**<br>**CO4-** To analyze functioning of differentcomputer graphicsalgorithms andvarious transformation techniques.**(BL4-Analyze)**<br>**CO5-** Toevaluatetheperformancecharacteristicsofvariouscomputergraphics algorithms.**(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG1(No poverty)<br>SDG2(Zero hunger)<br>SDG3(Good health and well-being)<br>SDG8(Decent work and economic growth) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| unit-1 | IntroductiontoComputerGraphics Computer Graphics introduction, Types of Computer Graphics, Application areas of Computer Graphics. Overview of Graphics System: Pixels, Frame Buffer, Display Controller, Lookup Table, Resolution, Aspect Ratio, Persistence, CRT, DVST. Raster and Random Scan Displays: Raster Scan Display, Random Scan Display. Color CRT Monitors: Beam Penetration CRT, Shadow Mask CRT. | Lecturing | 12 |
| Unit-2 | OutputPrimitives Scan Conversion and its Side effects, Output Primitives: Points and Lines. Line Drawing Algorithms: DDA Algorithm, Bresenhem's Line Drawing Algorithm. Circle drawing Algorithms: Properties of Circle, Bresenham's Circle Drawing Algorithm, Mid-Point Circle Drawing Algorithm | Lecturing | 10 |
| Unit-3 | 2D Geometrical Transformations: Translation, Rotation, Scaling, Shearing. Homogeneous Coordinates, Composite Transformations. Reflection. 3D Geometrical Transformations: Translation, Rotation, Scaling, and Reflection. 2D Windowing and Clipping: Window, Viewport, WCS, NDCS, Window to Viewport Coordinate Transformation. Line Clipping: Cohen Sutherland Algorithm, Midpoint Subdivision Algorithm. Polygon Clipping: types of polygons, Sutherland Hodgeman Polygon Clipping. | Lecturing | 10 |
| Unit-4 | ProjectionandCurves Projection:ParallelandPerspective. 3DObjectRepresentation:BezierandB-splineCurve. Color Models like RGB, CMY, YIQ, HSV and HLS. | case Stduy | 12 |
| Unit-5 | Multimedia<br>Multimedia:Introduction,MultimediaComponents,Applications,FileFormats–RTF,TIFF,MIDI,JPEG,DIB,MPEG.<br>Animation:Introduction,Rules,DifferentAnimation Techniques | case StduyLectures with whiteboard/PPT, | 8 |

## Experiment List of Computer Graphics

1.Write a program to implement DDA line drawing algorithm

2.Write a program to implement Bresenham's line drawing algorithm

3.Write a program to implement Bresenham's circle drawing algorithm.

4.Write a program to draw an ellipse using Bresenham's algorithm.

5.Write a program to perform various transformations on line , square & rectangle.

6.Write a program to implement Cohen Sutherland line clipping algorithm.

7.Write a program to implement Liang-Bersky line clipping algorithm.

8.Write a program to implement Cohen-Sutheland polygon clipping algorithm to clip a polygon with a Pattern.

9.Write a program to convert a color given in RGB space to it's equivalent CMY color space.

10.Study of various Multimedia file formats:-RTF,MIDI,GIF,JPEG,MPEG,TIFF etc.

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | Computer Graphics Donald Hearn,M.P.Baker |
| **Articles** | |
| **References Books** | Procedural Elements for Computer Graphics DavidF. Rogers |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | 2 | - | - | 2 | 2 | - | - | - | 2 | - | - | 1 | - | 1 |
| CO2 | 1 | 3 | 1 | 2 | 2 | 2 | - | - | - | 2 | - | - | 1 | - | 3 |
| CO3 | 2 | 2 | 1 | - | 1 | - | - | - | - | - | - | - | 3 | 2 | 3 |
| CO4 | - | - | - | 2 | 1 | - | - | - | - | - | - | - | 2 | 3 | 3 |
| CO5 | - | 1 | - | 2 | - | - | - | - | - | - | - | - | 2 | 2 | 3 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Mobile Computing |
| **Course Code** | BCA 604 |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 3rd | **Semester** | 6th | **Credits** | L | T | P | C |
| | | | | | 4 | 0 | 0 | 4 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Disciplinary Minor | | | | | | | |
| **Pre-Requisite/s** | Basic knowledge of computer fundamentals and basic concepts of network. | | | **Co-Requisite/s** | Basic knowledge of computer fundamentals and basic concepts of network. | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Understand and identify the GSM, GPRS and Bluetooth software model for mobile computing.**(BL1-Remember)**<br>**CO2-** The ability to develop applications that are mobile-device specific and demonstrate current practice in mobile computing contexts.**(BL2-Understand)**<br>**CO3-** Understanding of the characteristics and limitations of mobile hardware devices including their user-interface modalities**(BL3-Apply)**<br>**CO4-** Analyze QoS over wire and wireless channels**(BL4-Analyze)**<br>**CO5-** Able to promote the awareness of the life-long learning,business ethics, professional ethics and currentmarketing scenarios.Able to promote the awareness of the life-long learning,business ethics, professional ethics and currentmarketing scenarios.**(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG1(No poverty)<br>SDG4(Quality education)<br>SDG8(Decent work and economic growth)<br>SDG10(Reduced inequalities)<br>SDG12(Responsible consuption and production) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| 1 | Short history of wireless communication, Applications, Frequency for radio transmission, Signals, Antennas, Signal propagation, Multiplexing, Modulation, Spread Spectrum, Cellular systems (DSSS & FHSS). Motivation for a specialized MAC: Hidden and Exposed terminals. Near and Far terminals; Multiple access with collision avoidance, Polling, Inhibit sense multiple access; CDMA: Spread Aloha multiple access. | Lecturing | 8 |
| 2 | Telecommunication Systems I: PCS Architecture, Cellular Telephony: Advanced Mobile Phone Service(AMPS); Global System for Mobile Communication (GSM) Overview of Cordless Telephony and LowDigital European Cordless Telephone (DECT); UMTS, Personal Handy Phone System (PHS); Personal Access Communications System (PACS) ; Unlicensed Systems, 3G Wireless systems. Overview of Mobility Management Handoff, Network Signaling : Signaling System No.7, Interconnection and Message Routing, Mobility Management. | Lecturing | 8 |
| 3 | GSM: Mobile services, System Architecture, Radio interface, Protocols, Localization and Calling, Handover, Security, New data services, GSM Short Message Service, VOIP service for Mobile Networks : GSM on the Net. GPRS: Functional Groups, GPRS Architecture, GPRS Network Nodes:18.3.1 Mobile Station; Base Station System; GPRS Support Node; HLR and VLR, GPRS Interfaces: Um Interface. | PBL | 8 |
| 4 | Wireless LAN: Infrared vs. Radio transmission, Infrastructure and Ad hoc Networks, IEEE 802.11: System architecture, Protocol architecture, Physical layer, Medium Access Control layer, MAC management, Future development; HIPERLAN: Protocol architecture, Physical layer, Channel access control sublayer, Medium Access Control sublayer, Information bases and Networking. Bluetooth: User Scenarios, Physical Layer, MAC layer, Networking. Security, link management, Enterprise PCS | Case Study | 8 |
| 5 | Support for Mobility: Mobile Computing Architecture: Three Tier Architecture for mobile computing, Design considerations, Mobile Computing through Internet. File systems: Consistency, Examples; World Wide Web: Hypertext transfer protocol, Mobile File System, Mobile databases. | Lecturing | 8 |

## Part C

| Modules | Title | Indicative-ABCA/PBL/ Experiments/Field work/ Internships | Bloom's Level | Hours |
|---|---|---|---|---|
| Unit-4 | Case Study: Mobile Computing Infrastructure and Ad Hoc Networks | Case Study | BL2-Understand | 5 |
| Unit-3 | Project: Personal Fitness Tracker App Objective: Develop a personal fitness tracker mobile application that helps users monitor their physical activities, set goals, and track their progress over time. | PBL | BL4-Analyze | 10 |
| Unit-1 ,2 & 5 | Quiz | PBL | BL5-Evaluate | 5 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | Schiller, J. H. (2003). Mobile Communications. Pearson Education. |
| **Articles** | |
| **References Books** | Rappaport, T. S. (2010). Wireless Communications: Principles And Practice, 2/E. Pearson Education India. |
| **MOOC Courses** | |
| **Videos** | |

Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 1 | - | 2 | 1 | - | - | - | - | - | - | - | 2 | 2 | 2 |
| CO2 | 2 | 3 | 1 | 2 | 2 | - | - | - | - | - | - | - | 3 | 3 | 2 |
| CO3 | 2 | 3 | 1 | 2 | 2 | - | - | - | - | - | - | - | 3 | 3 | 3 |
| CO4 | 2 | 3 | 2 | 2 | 2 | - | - | - | - | - | - | - | 3 | 3 | 3 |
| CO5 | 1 | 2 | - | 2 | - | - | - | - | - | - | - | - | 2 | 2 | 3 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Physical Education |
| **Course Code** | BCA 605 (T) |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 3rd | **Semester** | 6th | **Credits** | L | T | P | C |
| | | | | | 2 | 0 | 1 | 3 |
| **Course Type** | Embedded theory and lab | | | | | | | |
| **Course Category** | Ability Enhancement Courses | | | | | | | |
| **Pre-Requisite/s** | Students should have knowledge about health & wellness. | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Recall the rules and terminology of various sports and physical activities.**(BL1-Remember)**<br>**CO2-** Explain the benefits of regular physical activity and a healthy lifestyle.**(BL2-Understand)**<br>**CO3-** Demonstrate proper techniques for basic skills in multiple sports.**(BL3-Apply)**<br>**CO4-** Compare and contrast different training methods and their effectiveness for specific fitness goals.**(BL4-Analyze)**<br>**CO5-** Assess personal fitness levels and set realistic improvement goals.**(BL5-Evaluate)**<br>**CO6-** Design a comprehensive workout plan tailored to individual fitness needs and goals.**(BL6-Create)** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG3(Good health and well-being) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit-1 | I Physical Fitness, Health and Wellness ● Meaning and Importance of Wellness, Health and Physical Fitness ● Components/Dimensions of Wellness, Health and Physical Fitness ● Traditional Sports & Regional Games for promoting wellness | group discussion, lecture with ppt, quiz | 8 |
| Unit-2 | Olympism ● Ancient and Modern Olympics ● Olympism – Concept and Olympics Values (Excellence, Friendship & Respect) ● Olympics - Symbols, Motto, Flag, Oath, and Anthem ● Olympic Movement Structure - IOC, NOC, IFS, Other members | Lecturing , Experiments | 9 |
| Unit-3 | Fundamentals of Anatomy, Physiology in Sports ● Definition and Importance of Anatomy and Physiology in exercise and sports ● Functions of Skeletal system, classification of bone and types of joints. ● Function and Structure of Circulatory system and heart. ● Function and Structure of Respiratory system. | Yoga,Sports | 10 |
| Unit-4 | Psychology & Sports ● Definition & Importance of Psychology in Physical Education & Sports ● Adolescent Problems & Their Management ● Team Cohesion and Sports | Yoga,Sports | 12 |
| Unit-5 | Training and Doping in Sports ● Concept and Principles of Sports Training ● Training Load: Over Load, Adaptation, and Recovery ● Concept of Doping and its disadvantages | Lectures with whiteboard/PPT, Recorded video/interactive videos | 9 |

Part C

## Physical Education

## Experiments

1.Physical Fitness Test: SAI Khelo India Test, Brockport Physical Fitness Test (BPFT) 5 Marks

2.Proficiency in Games and Sports (Skill of any one IOA recognised Sport/Game of Choice)5Marks

3.Yogic Practices 5 Marks

4.Record File 5Marks

5.Viva Voce (Health/ Games & Sports/ Yoga)` 20 Marks

Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

Part E

| | |
|---|---|
| **Books** | |
| **Articles** | |
| **References Books** | |
| **MOOC Courses** | |
| **Videos** | |

Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | 1 | - | - | - | - | - | - | - | - | - | 1 | 2 | - | - |
| CO2 | 1 | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - |
| CO3 | - | - | 1 | - | - | - | - | - | 2 | - | - | - | 2 | - | - |
| CO4 | - | - | - | - | 1 | - | - | - | - | - | - | - | 1 | 2 | - |
| CO5 | - | - | - | 1 | - | - | - | 1 | - | - | - | - | 1 | 2 | - |
| CO6 | - | 1 | - | - | - | - | - | - | - | 2 | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Major Project |
| **Course Code** | BCA 606 |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 3rd | **Semester** | 6th | **Credits** | L | T | P | C |
| | | | | | 0 | 0 | 2 | 2 |
| **Course Type** | Project | | | | | | | |
| **Course Category** | Field Projects | | | | | | | |
| **Pre-Requisite/s** | sofetware development life cycle, Project life cycle | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** CO1 : Understand the project Develpoment Life Cycle **(BL2-Understand)**<br>**CO2-** CO2 : Aplly the core discipline knowledge and develop a complete system for the given / chosen task**(BL3-Apply)**<br>**CO3-** CO3 : Analize the performance of the system develpoed using standard techniques for testing **(BL4-Analyze)**<br>**CO4-** CO4 : Evaluate the performacne of the system develpoed against the performance of similar tools./ systems **(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✓<br>Entrepreneurship ✕<br>Employability ✓<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✕<br>Environment ✕ | | **SDG (Goals)** | SDG4(Quality education)<br>SDG8(Decent work and economic growth) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit-1 | Understanding concept of Human Resource Management Concept, nature, scope, objectives and importance of HRM, Evolution of HRM, Challenges of HRM, Personnel Management vs HRM, Difference between PM and HRM, Role of HR Professional / Manager, Qualities of successful HR. Structure of HR Department, line and staff aspects of HRM. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 6 |

## Part C

| Modules | Title | Indicative-ABCA/PBL/ Experiments/Field work/ Internships | Bloom's Level | Hours |
|---|---|---|---|---|
| 1 | Develop Synopsis for the proposed / chosen topic | PBL | BL2-Understand | 10 |
| 2 | Develop prototype of the ysstem proposed | PBL | BL3-Apply | 30 |
| 3 | Performa testing on the modules and the ysstme as a whole | Experiments | BL4-Analyze | 10 |
| 4 | incoporate the changes required based on testing result | PBL | BL3-Apply | 10 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | |
| **Articles** | |
| **References Books** | |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | 2 | - | - | 2 | - | - | 1 | - | - | 2 | 1 | 2 |
| CO2 | - | - | - | 2 | - | - | 2 | - | - | 2 | - | - | 1 | 2 | 1 |
| CO3 | - | - | - | - | - | - | 1 | - | - | - | - | - | 2 | 2 | 1 |
| CO4 | - | - | - | 1 | - | - | - | - | - | 2 | - | - | 1 | 1 | 3 |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | Human Resource Management |
| **Course Code** | BCA 607 |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 3rd | **Semester** | 6th | **Credits** | L | T | P | C |
| | | | | | 2 | 0 | 0 | 2 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Disciplinary Major | | | | | | | |
| **Pre-Requisite/s** | Students should be familiar with Management of Human Resource in Organizations. | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** CO1: Develop the understanding of the concept, functions and processes of human resource management and to understand its relevance in organizations.**(BL1-Remember)**<br>**CO2-** CO2: Integrate perspective on role of HRM in modern business. Ability to plan human resources, forecasting & strategies.**(BL2-Understand)**<br>**CO3-** CO3: Measure- Employee Involvement, Diversity, competencies, Absenteeism, Employee Turnover, Employee Retention, Job Satisfaction, Employee Loyalty, Employee Commitment, Stress and Performance.**(BL3-Apply)**<br>**CO4-** CO4: Develop and use of Performance Management System, Write a job advertisement.**(BL4-Analyze)**<br>**CO5-** CO5: Design and formulate various HRM processes such as Recruitment, Selection, Training, Salary and Reward Administration, Compensation, Retention, Separation etc. **(BL5-Evaluate)** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✓<br>Human Values ✓<br>Environment ✕ | | **SDG (Goals)** | SDG4(Quality education)<br>SDG8(Decent work and economic growth) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit-1 | Understanding concept of Human Resource Management Concept, nature, scope, objectives and importance of HRM, Evolution of HRM, Challenges of HRM, Personnel Management vs HRM, Difference between PM and HRM, Role of HR Professional / Manager, Qualities of successful HR. Structure of HR Department, line and staff aspects of HRM. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 6 |
| 2 | Acquisition of Human Resources Human Resource Planning: Process of human resource planning, forecasting demand and supply, succession planning. Job Analysis: Uses and Methods, Job description and Job specification. Recruitment, selection & orientation: Internal & external sources of recruitment, e-recruitment, advantages & problems of internal & external recruitment, steps in placement and selection process, Selection tests and Interview, Orientation Programme and Induction. Job changes - transfers, promotions/demotions, separations | Lectures with whiteboard/PPT, Recorded video/interactive videos | 10 |
| 3 | Training and Development Concept and importance of training; types of training; methods of training; design of training programme; evaluation of training effectiveness; executive development - process and techniques, Mentoring and Coaching | Lectures with whiteboard/PPT, Recorded video/interactive videos | 10 |
| 4 | Performance Management System Performance and Potential appraisal - concept and objectives; traditional and modern methods, limitations of performance appraisal methods, Rating Errors and Biases, Uses of performance appraisal, Career Management: Career anchors, career life stages, career planning. . | Lectures with whiteboard/PPT, Recorded video/interactive videos | 9 |
| 5 | Compensation Define reward, compensation, wage, salary, job evaluation - concept, process and significance, factors affecting employee remuneration; components of employee remuneration - base and supplementary, minimum, fair and living wage, types of benefits and services, incentive schemes. Maintenance: overview of employee welfare, health and safety, social security. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 8 |

## Part C

| Modules | Title | Indicative-ABCA/PBL/ Experiments/Field work/ Internships | Bloom's Level | Hours |
|---|---|---|---|---|
| 1-5 | | PBL | | |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | Gerry Dessler, Human Resource Management, Pearson Publication |
| **Articles** | |
| **References Books** | Human Resource Management by R. Wayne Mondy, Pearson Publications, Delhi |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | 1 | - | - | 1 | - | - | 2 | - | - | - | - | - | - | - |
| CO2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO3 | 1 | - | - | 2 | - | - | - | - | - | - | - | - | 1 | 2 | 3 |
| CO4 | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | 3 | - | - | 1 | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | 1 | - | 2 | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | NCC |
| **Course Code** | NCC 606(P) |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 3rd | **Semester** | 6th | **Credits** | L | T | P | C |
| | | | | | 2 | 0 | 2 | 4 |
| **Course Type** | Lab only | | | | | | | |
| **Course Category** | Generic Elective | | | | | | | |
| **Pre-Requisite/s** | Should be acquainted with the basics knowledge of General Awareness about Leadership Quality, Personality Development, Defense system etc | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Perform foot drill and follow the different word of command. **()**<br>**CO2-** Aiming range and figure targets. **()**<br>**CO3-** Use the different knots and lashing in day-to-day life for different purposes. **()**<br>**CO4-** Develop the feeling of altruism. **()** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✓<br>Environment ✕ | | **SDG (Goals)** | SDG3(Good health and well-being)<br>SDG4(Quality education)<br>SDG6(Clean water and sanitation) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1. Drill | (i) Ceremonial Drill. (ii) Guard of Honour. | | 4 |
| Unit 2. Weapon Training | Short Range firing. | Lecture, Tutorials, Group discussion, Collaborative work,self-study, individual and group tasks, team work, field-based assignments, Physical Training, endurance building and skill development practices | 5 |
| Unit 3. Map Reading(MR) | Google maps and Applications. | Lecture, Tutorials, Group discussion, Collaborative work,self-study, individual and group tasks, team work, field-based assignments, Physical Training, endurance building and skill development practices | 3 |
| Unit 4. Field Craft & Battle Craft(FCBC) | Knots, Lashing and Stretchers. | Lecture, Tutorials, Group discussion, Collaborative work,self-study, individual and group tasks, team work, field-based assignments, Physical Training, endurance building and skill development practices | 4 |
| Unit 5. Social Service and Community Development(SSCD) | Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc as per the requirement and similar announced days- National and State level. | Lecture, Tutorials, Group discussion, Collaborative work,self-study, individual and group tasks, team work, field-based assignments, Physical Training, endurance building and skill development practices | 4 |
| Unit 6 Introduction of Infantry Weapons &Equipment(INF) | Characteristics of 5.56MM INSAS Rifle, Ammunition, Fire Power, Stripping, Assembling & Cleaning Practice. | Lecture, Tutorials, Group discussion, Collaborative work,self-study, individual and group tasks, team work, field-based assignments, Physical Training, endurance building and skill development practices | 4 |
| Unit 7. Communication (COM) | (i) Basic Radio Telephony (RT) Procedure. (ii) Introduction, Advantages, Disadvantages, Need for standard procedures. 47 (iii) Types of Radio telephony communication. (iv) Radio telephony procedure, Documentation. | Lecture, Tutorials, Group discussion, Collaborative work,self-study, individual and group tasks, team work, field-based assignments, Physical Training, endurance building and skill development practices | 6 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| | | | | | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 0 | 0 | 0 | 0 | 0 | 0 |

## Part E

| | |
|---|---|
| **Books** | R Gupta ; NCC National Cadet Corps A, B & C Certificate Examination Book; Ramesh Publishing House, 2018. Singh, Neeraj; A Hand Book of NCC; Kanti Prakashan Publisher Cadet training hand book specialised subjects (2017) |
| **Articles** | https://indiancc.mygov.in/ |
| **References Books** | Cadets training handbook common subjects (2017), D.G NCC Delhi-110030 DG, NCC Training directive |
| **MOOC Courses** | |
| **Videos** | https://www.youtube.com/watch?v=wnzPVZsm_PE |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2023-2024

## (SOET)(BCA)

| | |
|---|---|
| **Title of the Course** | NCC |
| **Course Code** | NCC0606 (T) |

Part A

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 3rd | **Semester** | 6th | **Credits** | L | T | P | C |
| | | | | | 2 | 0 | 2 | 4 |
| **Course Type** | Theory only | | | | | | | |
| **Course Category** | Generic Elective | | | | | | | |
| **Pre-Requisite/s** | Should be acquainted with the basics knowledge of General Awareness about Leadership Quality, Personality Development, Defense system etc | | | **Co-Requisite/s** | | | | |
| **Course Outcomes & Bloom's Level** | **CO1-** Understand individaul responsibilities & role in meetings the security challenges on Border/Coastal areas. **()**<br>**CO2-** Write their CV effective and appealing. **()**<br>**CO3-** Imbibe the feeling of patriotism. **()**<br>**CO4-** Communicate more effectively.**()**<br>**CO5-** Face SSB interview effectively in their future. **()** | | | | | | | |
| **Coures Elements** | Skill Development ✕<br>Entrepreneurship ✕<br>Employability ✕<br>Professional Ethics ✕<br>Gender ✕<br>Human Values ✓<br>Environment ✕ | | **SDG (Goals)** | SDG3(Good health and well-being)<br>SDG4(Quality education)<br>SDG6(Clean water and sanitation) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1. Personality Development | (i) Career Counselling. (ii) SSB Procedure. (iii) Interview Skills. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 2. Border & Coastal Areas | Security Challenges & Role of cadets in Border management. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 3. Armed Forces | Modes of Entry into Army, Police and CAPF. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 4. Military History | (i) Biographies of Renowned Generals. (ii) War Heroes : Param Veer Chakra Awardees. (iii) Study of Battles of Kargil. (iv) War Movies. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit-5.Communication | Introduction to Communication & Latest Trends. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |

Part D(Marks Distribution)

| **Theory** | | | | | |
|---|---|---|---|---|---|
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 40 | 60 | 18 | 40 | |
| **Practical** | | | | | |
| **Total Marks** | **Minimum Passing Marks** | **External Evaluation** | **Min. External Evaluation** | **Internal Evaluation** | **Min. Internal Evaluation** |
| 100 | 50 | 60 | 30 | 40 | |

## Part E

| | |
|---|---|
| **Books** | R Gupta ; NCC National Cadet Corps A, B & C Certificate Examination Book; Ramesh Publishing House, 2018. Singh, Neeraj; A Hand Book of NCC; Kanti Prakashan Publisher |
| **Articles** | https://indiancc.mygov.in/ |
| **References Books** | Cadets training handbook common subjects (2017), D.G NCC Delhi-110030 DG, NCC Training directive |
| **MOOC Courses** | |
| **Videos** | https://www.youtube.com/watch?v=O8pIJglsYUE |

## Course Articulation Matrix

| **COs** | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |